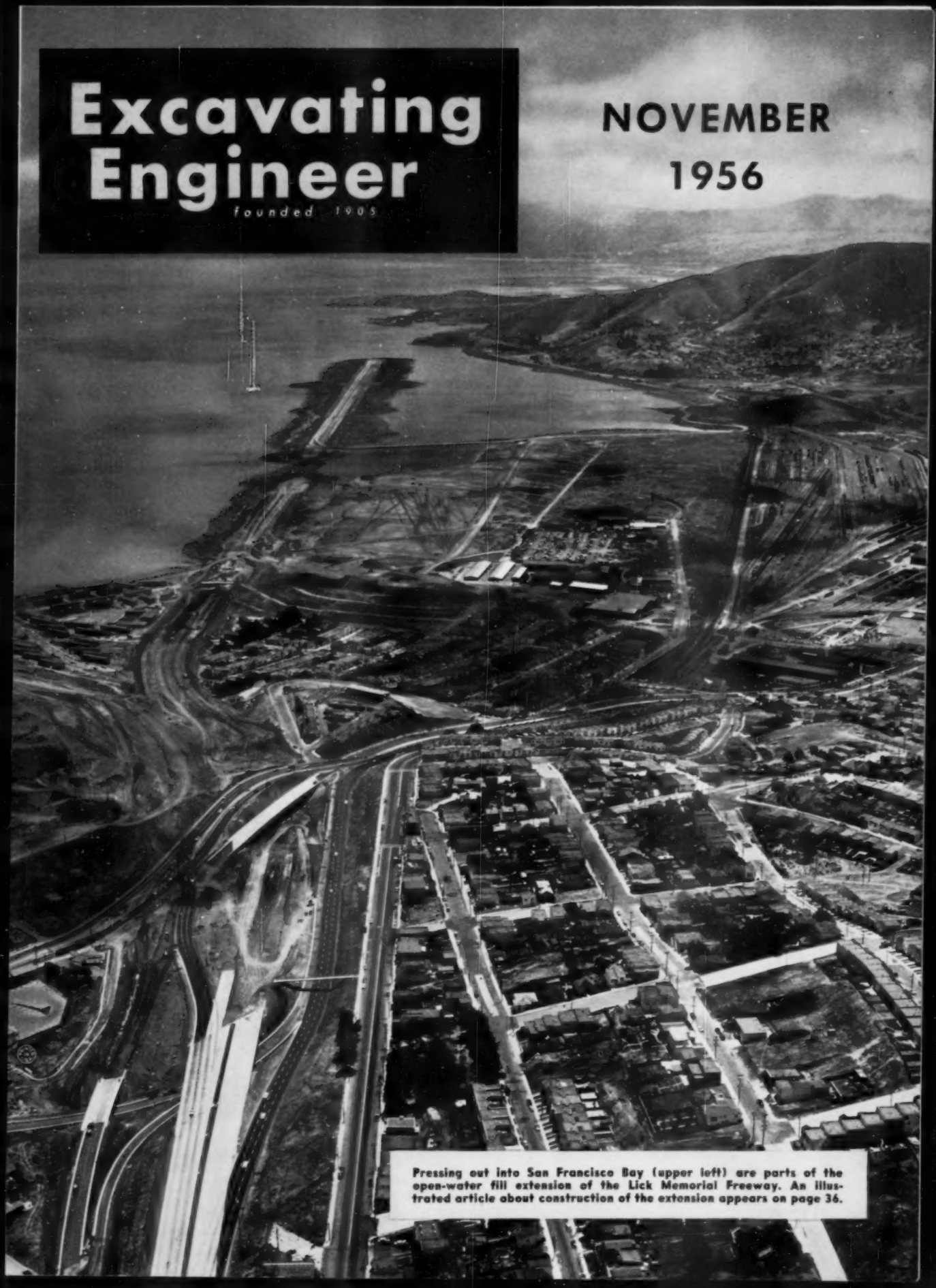
Excavating Engineer

Founded 1905

NOVEMBER
1956



Pressing out into San Francisco Bay (upper left) are parts of the open-water fill extension of the Lick Memorial Freeway. An illustrated article about construction of the extension appears on page 36.

BUCYRUS-ERIE CRANES'
Built-in Bonus Boosts Profits

Cash in on the built-in bonus you get with a Bucyrus-Erie crane — its ability to operate with a minimum of downtime. Maintenance, service and repair costs are cut, turned into more profit on your crane jobs. Reason: highest quality construction.

The Bucyrus-Erie metallurgical laboratory maintains constant control over various phases of the process. It keeps a close check on the modern forging and heat-treating methods, which assure strength, toughness, and hardness so essential to economical machine operation in the field. Through testing and research, the laboratory seeks constant improvement of the product. Even in such seemingly small details of manufacture as the testing of foundry sands, the company's technicians always aim for perfection.

No wonder that construction men everywhere have hailed Bucyrus-Eries for productive, low-maintenance operation. Find out soon from your Bucyrus-Erie distributor how YOU can profit with one or more of these cranes on the job. Capacities (75% rating) range from 8,900 lbs. (model 10-B with 30-ft. boom at 10-ft. radius) to 124,000 lbs. (model 88-B with 70-ft. boom at 20-ft. radius). All cranes are fully convertible to shovel, dragline, and clamshell — plus dragshovel for machines through 2½-yd. capacity. 219E56C

BUCYRUS ERIE

South Milwaukee, Wisconsin

See us at the ROAD SHOW CHICAGO Jan. 28-Feb. 2, 1957

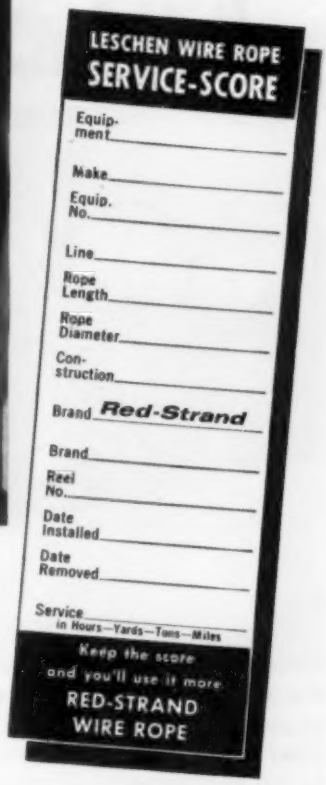
Bonus Quality Specifications for molding and core sands are rigidly adhered to in the production of steel and bronze castings. Sand compositions must meet close specifications for permeability, moisture content, compression strength, and high-temperature properties. Here, a laboratory technician uses an electronic meter to determine the pH (acid-alkaline ratio) of the sand mixture.

Accurate, reliable boom control, so important for such jobs as this storm sewer laying project in Pennsylvania, is a feature in which the 15-B excels. On-the-job convertibility to the clamshell bucket in the background is quick and easy, allowing the 15-B to perform double-duty work economically.

Unusual stability that provides high lifting capacity per pound of weight, makes the 22-B ideal for lifting crane service. The 22-B shown here is swinging a concrete bucket in construction of a highway bridge in Kentucky.

The liberal use of anti-friction bearings in Bucyrus-Erie machines gives smoother performance, and helps keep maintenance costs low. Here, a 54-B crane places steel sections in construction of a flood control pumping station in Kentucky.

Strength without deadweight and easy, speedy operation make the 88-B a high producer in the heavy construction field, help cut maintenance costs. Such qualities are needed for jobs like this steel erection project for a California bridge.



SERVICE-SCORE STICKERS

provide valuable wire rope facts

... to test performance, speed reordering

For efficient wire rope operation you must have wire rope facts—brief, handy, accurate facts. You need them for safety (when did that line go on?). You need them for reordering (what size is the hoist line?). And you need them most of all for figuring cost (how long did it last?).

But gathering wire rope facts can be time-consuming—unless you have an easy, simple system.

Leschen's Service-Score Stickers provide such a system. The facts are always at hand—on the machine while the wire rope is working, and in the record book from then on.

Service-Score Stickers make it easy to compare the service you get from various rope constructions, types, and brands, so you *know which one is best* for you.

With the Service-Score System you prove to yourself that Red-Strand wire rope consistently exceeds industry standards for strength and safety.

Write for your starting supply of Service-Score Stickers now—or see your Leschen distributor.

LESCHEN
Red-Strand
WIRE ROPE

Keep the score and you'll use it more—Red-Strand Wire Rope

LESCHEN WIRE ROPE DIVISION
H. K. PORTER COMPANY, INC.
St. Louis 12, Missouri

A DIVISION OF H. K. PORTER COMPANY, INC. **HKP**

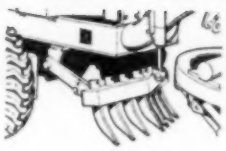
Allis-Chalmers LOW-COST Model D | BIG in power in strength in versatility

THE MODEL D GRADER HAS THE POWER to tackle bigger jobs. With either 50-hp gasoline engine or 50-hp diesel engine, there's extra torque and lugging ability for top performance on all projects.

BIG-GRADER DESIGN means long life for the Model D — regardless of the job. Strong, single-member main frame . . . husky drawbar and one-piece circle . . . work-boosting ROLL-AWAY moldboard . . . ground-gripping tandem drive . . . precision control . . . easy operation and simple servicing — all are plus performance advantages.

JOB-MULTIPLYING ATTACHMENTS make the Model D a *specialist* on many applications:—

ROLL-AWAY is an Allis-Chalmers trademark.



HYDRAULIC SCARIFIER — exclusive mid-ship mounting under D's heavy end for better steering, maximum traction and full penetration. With seven removable teeth, scarifier cuts a swath 27¾ in. wide.

ALSO output-boosting extras — rear-mounted ⅝-yd loader, shoulder maintainer, windrow eliminator, snow-plow blades. Plus optional equipment — including power circle turn, shiftable moldboard, leaning front wheels, all-weather cab, heater, etc.

ALLIS-CHALMERS, CONSTRUCTION MACHINERY DIVISION
MILWAUKEE 1, WISCONSIN

ALLIS-CHALMERS

See the Model D at your Construction Machinery Dealer — headquarters for True Original Parts and Service.

Advertisers

IN THIS ISSUE

Allis-Chalmers Mfg. Co. 2, 21
American Hoist & Derrick Co., Crosby-Laughlin Div. 57
American Road Builders' Assn. ... 52–53
American Steel & Wire Div., U. S. Steel Corp. 17–20
Bethlehem Steel Co. 6
Bucyrus-Erie Co. Cover II, 13, 22–23, 50, 56, 66–67, 73
Buda Div., Allis-Chalmers Mfg. Co. ... 21
Caterpillar Tractor Co. 8–9, 43, 46–47, 55, 58–59, Cover IV
Colorado Fuel & Iron Corp. 61
Columbia-Geneva Steel Div., U. S. Steel Corp. 17–20
Crosby-Laughlin Div., American Hoist & Derrick Co. 57
Drake-Williams Mount 74
Eimco Corp., The ..... Cover III
Ensign-Bickford Co., The 7
Euclid Div., General Motors Corp. 14–15
For Sale (Classified) 76
Foster, L. B. & Co. 74
General Motors Corp., Euclid Div. 14–15
Hayward Co., The 45
Hendrix Mfg. Co. 69
Hercules Powder Co. 12
Hough Co., The Frank G. 65
Ingersoll-Rand Co. 11
International Harvester Co. 40–41
Kiesler, Jos. F. Co. 49
Leschen Wire Rope Div., H. K. Porter Co., Inc. 1
Le-Tourneau-Westinghouse Co. ... 4, 62–63
Mack Trucks, Inc. 16
Macwhyte Co. 44
Marion Power Shovel Co. 70–71
M-R-S Mfg. Co. 75
Northwest Engineering Co. 5
Porter, H. K. Co., Inc., Leschen Wire Rope Div. 1
Roebling's Sons Corp., John A. 61
Salem Tool Co., The 48
Sauerman Bros., The 10
Tennessee Coal & Iron Div., U. S. Steel Corp. 17–20
United States Steel Corp. 17–20
United States Steel Export Co. ... 17–20

Excavating Engineer

founded 1905

CONTENTS

Volume 50 No. 11 **November, 1956**

Canada's Growing Iron Ore Giant 24
Output of Canada's largest iron ore producer is growing by leaps and bounds. Large, modern equipment spread, including new rotary blast hole drills, is geared to handle big yardage.

Meekins Helps Florida's Growth 32
Business prospers for sand and lime rock firm founded in 1922 with pick, shovel.

Canadians Progress on Seaway Construction 34
Structures are rising as work enters second phase of the five-year schedule. Much excavation remains, however. One major, several minor contracts have been completed in Lachine area.

Here Are Nine Quick, Sure Ways to Ruin Drill Steel 35

California Builds Bayshore Freeway—by R. H. Harnett 36
Open-water fill extension of Lick Memorial Freeway across arm of San Francisco Bay will help speed traffic into San Francisco and Oakland. Earth, rock fill dumped to depths of 80-90 feet.

News from the Field 42

Indiana Dedicates Road 42
Bridge Company Honored 42
AGC Foresees Increase 42
Jersey Opens Extension 45
Says Jetting Compaction Unsatisfactory 45
Lockwood Heads ASCE 45
Finn Assigned to Test 45

Obituary—Edmund W. Griffith 45

Equipment You Ought to Know About 48

Not in the Contract 54

New Trade Literature 72

COPYRIGHT 1956 BY THE EXCAVATING ENGINEER PUBLISHING COMPANY

Regular Subscription (payable in advance): 35 cents per copy, $3.50 a year; Canada and foreign, subject to publication policy, $5.00 per year. Special subscription: Upon written request on company letterhead this publication will be sent free of charge to companies, executives and supervisors engaged actively in excavating. Occupation of subscriber must be given for all subscriptions, paid or special. Right is reserved to refuse foreign subscription. Indexed by Engineering Index, Inc. Volumes available on microfilm.

Published Monthly by

THE EXCAVATING ENGINEER PUBLISHING COMPANY

South Milwaukee, Wisconsin, U.S.A.

W. E. WILLIAMS, Editor
M. B. JAEGER, Publisher
H. A. BURKHARDT, Manager
J. C. DeLONG, Associate Editor
E. W. ARNDT, Art Editor
W. C. VAN DYKE, Sales Manager

BPA Member

Have you seen the brand-new C Tournapull with increased-capacity "Fullpak" scraper? It's lower, wider, better-than-ever! Loads faster, boils easier . . . heaps 18-yd. pay-loads for more profitable dirtmoving. Ask for details.

Loading from ledge, Tournapull-Tournatractor team speeds dirtmoving operations on 90-acre housing project. Contractor E. R. Fenwick found one Tournatractor sufficient to push-load his 3 high-capacity "C's", and keep them busy moving wet, red shale.

Level 90,000 yds. of red shale for future 400-home subdivision

To cut and fill a hilly 90-acre site in preparation for the erection of 400 homes, Everett R. Fenwick of Matawan, N.J., employed 3 C Tournapulls to haul dirt . . . and a dozer-equipped Tournatractor to push-load the "C's" and handle clean-up.

This project, known as Roosevelt Park Housing Development, at Woodbridge, N.J., is being built by Sommer Brothers of Iselin, N.J. — who hired Fenwick for the 90,000-yd. cut-and-fill work. Material was red shale . . . heavy, difficult to load, and wet.

Average pay-load of high void shale picked up by Tournapulls was 10 cu. yds. On a round trip distance of 816′ cycle-time was 3 min. 5 sec., average. "Pulls" had to climb a 15% grade on return trip. Because of scattered areas of cut and fill, no haul-road, as such, was possible. "C's" had constantly rough hauls.

"Tops for big jobs"

"C Tournapulls are tops for big earthmoving work", Fenwick said. "I also have two D Tournapulls, which I use on smaller assignments. The combination of the two makes it possible for me to handle any type of earthmoving job with confidence."

"My Tournatractor has also proven itself to me by solid performance and utmost economy on many projects," he added.

Tournapulls can help you

You may have a job similar to those successfully handled by this New Jersey contractor. If so, you can benefit from Tournapull's rubber-tired mobility and easy to handle electric-control system. Let us show you owner-verified facts on Tournapull and Tournatractor performance. There's a size and type machine to do *your* job in less time, at bigger profit!

C Tournapull loads fast, packs big yardage in bowl. Dozer-equipped Tournatractor has power and speed to push-load "C" fast.

C Tournapull spreads load, then uses 90° power-steer to swing around in turn leaving fill. Maneuverable "C's" work handily in narrow spaces . . . ride smoothly.

Fullpak—Trademark, Tournapull, Tournatractor—Trademark Reg. U.S. Pat. Off. P-1004-8-b

LeTourneau-WESTINGHOUSE Company, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

ARBA

See you at the ROAD SHOW • Chicago • January 28-February 2, 1957

Model 80-D
2½ yd. Capacity

Every NORTHWEST a ROCK Shovel!

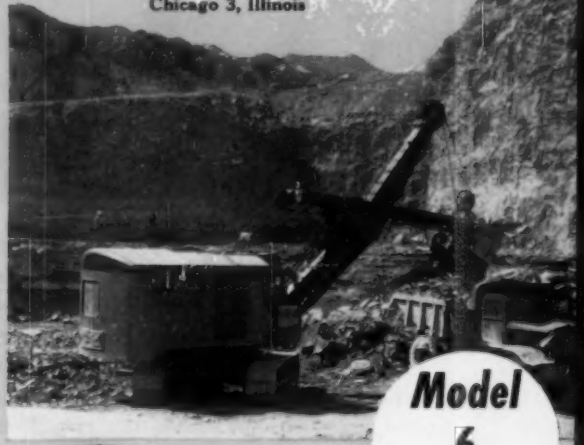
Here again you see *more* installations of Northwests in rock. Every Northwest is a *real* Rock Shovel because Northwests bring you the advantages that *make* a real Rock Shovel.

The Northwest Dual Independent Crowd that utilizes force most independent crowd shovels waste, the "Feather-Touch" Clutch Control, the Cushion Clutch, Northwest design and construction and other Northwest features all combine to give high output in tough digging.—And, if you have a *real* Rock Shovel you never have to worry about output in *any kind* of digging.

Model 41
1 yd. Capacity

NORTHWEST ENGINEERING COMPANY
1506 Field Building • 135 South La Salle Street
Chicago 3, Illinois

Model 25
¾ yd. Capacity



Model 6
1½ yd. Capacity

GS-6-1CG

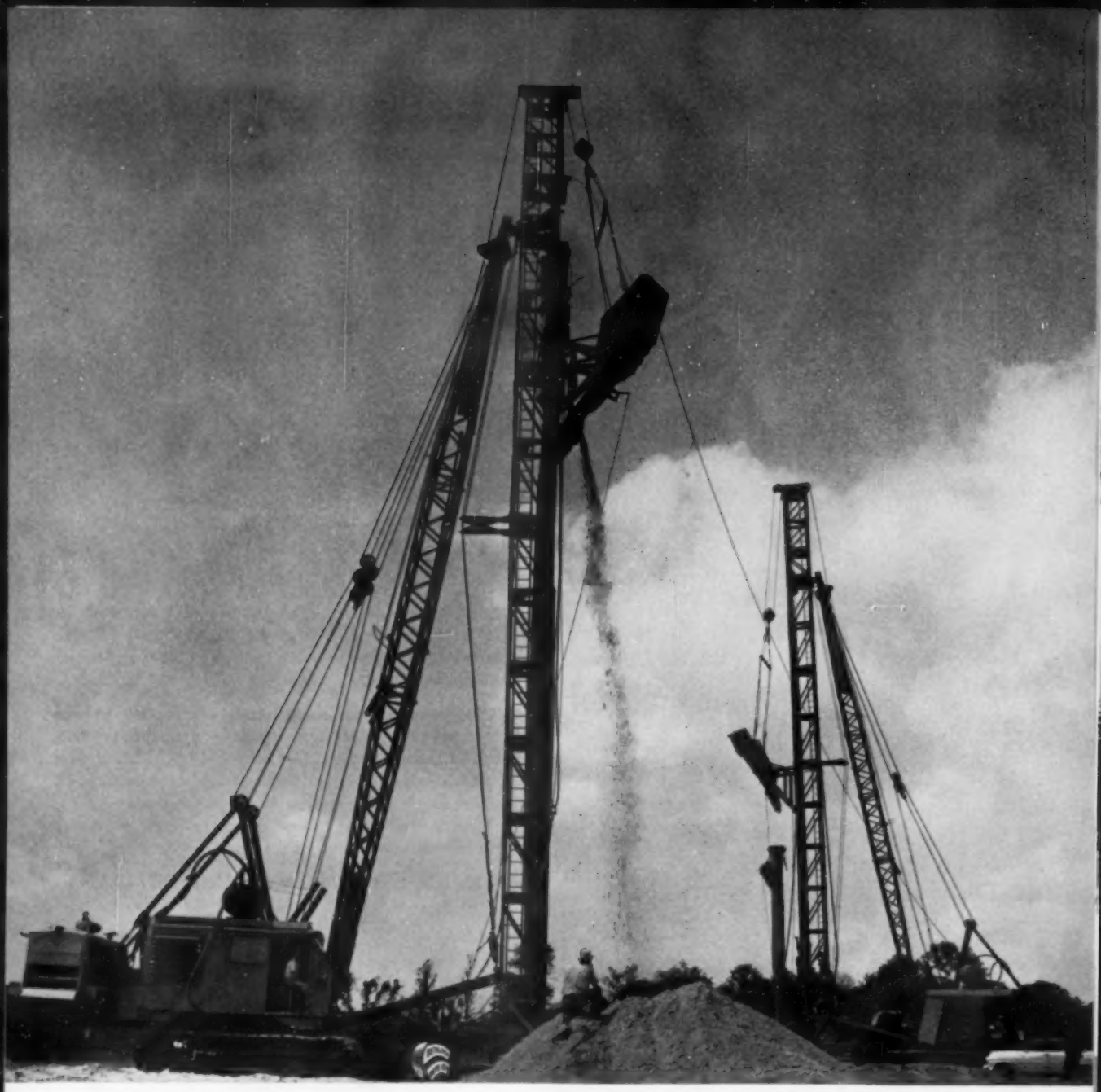
NORTHWEST

CRAWLER and TRUCK MOUNTED SHOVELS • CRANES • DRAGLINES • PULLSHOVELS

PRODUCTION PLUS • $ • MEANS MONEY

BUILD BETTER ROADS TODAY • FOR A GREATER AMERICA

See you at the ROAD SHOW CHICAGO Jan. 28-Feb. 2, 1957
AMERICAN ROAD BUILDERS ASSOCIATION



Wire Rope at Work—In constructing a portion of New Jersey's North-South Freeway, Route 42, the builders were faced with a difficult drainage problem. In boglands near Philadelphia, it was necessary to drive sand drains into the earth, then place cross-drains near the surface and top everything with overburden. The weight of this top layer "squeezed" the bog and forced water up the sand columns and into the cross-drains.

Hercules Concrete Pile Co. contracted to install 500,000 lineal ft of drainage system. The photograph above shows one important phase of the work—filling a casing with sand. The task of ramming the casings into the ground was handled by hard-hitting pile-drivers. To lift the bulky rams for every stroke, the rigs were fitted with Bethlehem Purple Strand—a wire rope so tough that it stood up easily under the merciless demands of the job.

Bethlehem Steel Company, Bethlehem, Pa. On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

Mill depots and distributors from coast to coast stock Bethlehem rope for the following industries and numerous others:

CONSTRUCTION • EXCAVATING • MINING • QUARRYING • PETROLEUM • LOGGING • MANUFACTURING

PLEASE SHOW THIS ADVERTISEMENT TO YOUR BLASTING FOREMAN

Use this loop-lock half-hitch to connect a trunk line with a branch line of Plastic Reinforced or

PLASTIC WIRE COUNTERED PRIMACORD

This type of Primacord is highly resistant to abrasion and shearing. It is also extremely strong (300 pounds tensile). It is waterproof, and resistant to acids . . . . All of which makes this type the ideal Primacord for use with metal and fibre explosives containers . . . in deep, jagged, wet holes . . . wherever down-hole conditions are *tough*.

Plastic Wire Countered Primacord is far less flexible than the Plain and Reinforced types, and its plastic covering is *smooth*. So, play it safe . . . use a continuous, unbroken length in the hole, and attach the down line to the trunk line at a right angle with the loop-lock half-hitch shown here.

See your Explosives Supplier, or write to
THE ENSIGN-BICKFORD COMPANY
Simsbury, Connecticut *Established 1836*
Also Safety Fuse, Ignitacord®, Quarrycord, Blasting Accessories

1. Bend a figure eight (8) in the Plain or Reinforced Primacord trunk line. This will be your half-hitch.

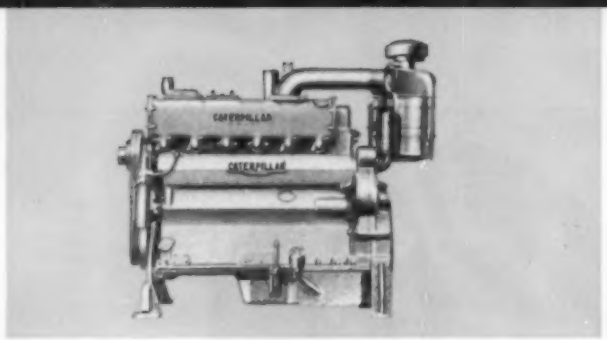
2. Loop the end of the Plastic Wire Countered Primacord branch line and pass this loop through the figure eight as shown.

3. Pull the Primacord trunk line *tight* so that the half-hitch grips the doubled-over branch line below the loop.

4. Pass the free end of the branch line Primacord up through the loop as shown above. It can't slip off now!

PRIMACORD®
DETONATING FUSE
PROVED AND APPROVED

P-23



A QUARTER CENTURY OF

A CATERPILLAR FIRST
--the "Hi-Electro" hardened cylinder liner

A CATERPILLAR FIRST
—the chemically conditioned cylinder liner

A CATERPILLAR FIRST
—the stainless-steel piston protector

A CATERPILLAR FIRST
—the steel-backed aluminum bearing

A quarter of a century ago, Caterpillar created mobile diesel power. For the first time, the power of the diesel engine was unleashed from its bulky foundations and put to work in the field—compact, economical. Here was diesel power of simple design, with no need for experts to operate and maintain. Here was diesel power with the lugging ability to knuckle down to the tough jobs.

The introduction of mobile diesel power was a tremendous advance in many fields. It provided efficient diesel power for tractors, motor graders, earthmoving equipment . . . for the work boat, the gin, the locomotive, the oil rig, the municipal plant . . . for *any* application in which steady, low-cost power is crucial. And everywhere, CAT* Diesel Engines proved themselves durable and dependable. They established Caterpillar as the leader in diesel engineering.

Today, hundreds of thousands of modern heavy-duty Cat Diesels are on the job in every corner of the world. And still the research continues. Study and experiment go ahead constantly in Caterpillar laboratories. Special testing machines help point the way toward new advances. Manufacturing techniques improve, too, in the world's largest diesel engine factory—where the quality of workmanship is the standard for the industry.

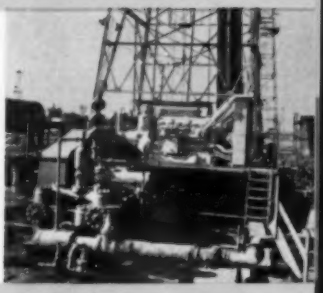
A modern world must have modern power—more and more of it. It is coming, in ever increasing quantity, from the production lines of Caterpillar, the leader.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

DIESEL POWER FOR PROGRESS



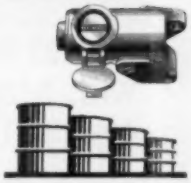
DIESEL LEADERSHIP

A CATERPILLAR FIRST
—interchangeable, adjustment-free fuel injection equipment

A CATERPILLAR FIRST
—the capsule-type injection valve

A CATERPILLAR FIRST
—the service meter

A CATERPILLAR FIRST
—superior lubricants (detergent oils)



NEW SAUERMAN SLACKLINE CABLEWAY INCREASES PRODUCTION OVER 25%

Bucket breaks water with heaping load from a 100 ft. depth...

is conveyed and dumped automatically at surge pile.

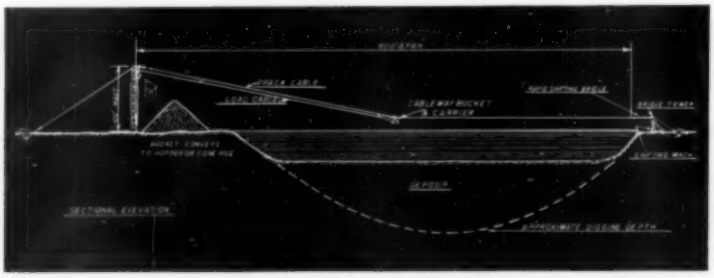
Wherever deep digging is required and operating spans are long, the new Sauerman Slackline is adding to its margin of superiority over other types of excavators. Production increases of over 25% and in some unusual cases as high as 80% are reported.

Not only is production increased but operating costs are lowered as cable and hoist wear is reduced and the machine runs with fewer peak loads and shocks—all possible from a cushioned drive using a torque convertor and other refinements.

These benefits are also available to present owners of slackline cableways. Guaranteed Gravel & Sand Co., a Sauerman Slackline user for over 35 years, has increased hoist speeds from 230 to 350 fpm. on the digging cycle and conveying speed to 800 fpm.—a gain of 25%. Guaranteed's 2-cu. yd. bucket is digging 450 ft. away from the surge pile and delivers 150 cu. yds. per hr.

The Sauerman Method lets you work distant material—up to 1,000 ft. away and dig 100 ft. or more below water. Now more than ever the greater tonnage available through fluid drive operation makes a Sauerman Slackline Cableway the low cost way for deep digging.

Get the best machine for your job. Write to Sauerman for expert advice on any materials handling project. For additional information on slackline cableways, ask for Catalog C.



Above drawing was prepared for a specific slackline installation and does not represent maximum spans. Rapid shifting bridle is not needed for many deposits.

Guaranteed Gravel and Sand Co.'s slackline bucket dumps 150 cu. yds. per hr. on surge pile from digging point 450 ft. away.

SAUERMAN BROS. INC. 622 SOUTH 28TH AVENUE • BELLWOOD, ILLINOIS

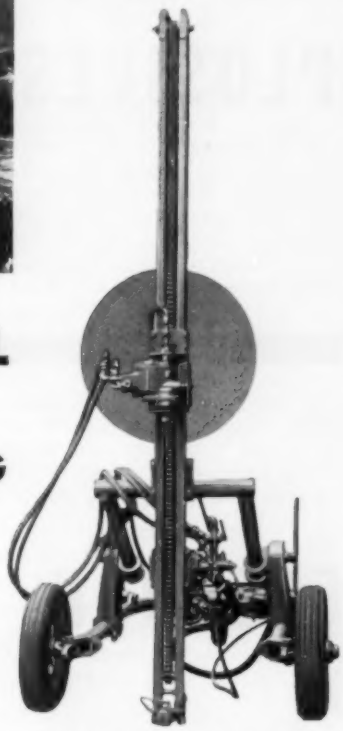
CRESCENT SCRAPERS • SLACKLINE and TAUTLINE CABLEWAYS • DUROLITE BLOCKS

The new FM-4 is even more rugged and versatile than its famous predecessor, the FM-3, shown here at work on the Connecticut Thruway.

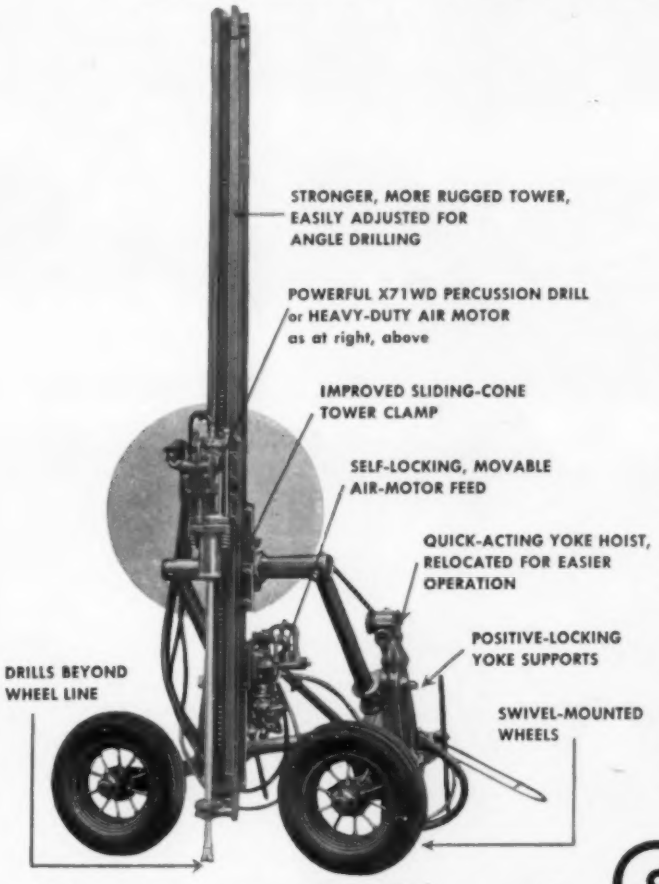
NEW FM-4 WAGON DRILL

now available for

PERCUSSION or ROTARY DRILLING



FM-4 Wagon Drill with air motor for rotary drilling.


STRONGER, MORE RUGGED TOWER, EASILY ADJUSTED FOR ANGLE DRILLING
POWERFUL X71WD PERCUSSION DRILL or HEAVY-DUTY AIR MOTOR as at right, above
IMPROVED SLIDING-CONE TOWER CLAMP
SELF-LOCKING, MOVABLE AIR-MOTOR FEED
QUICK-ACTING YOKE HOIST, RELOCATED FOR EASIER OPERATION
POSITIVE-LOCKING YOKE SUPPORTS
DRILLS BEYOND WHEEL LINE
SWIVEL-MOUNTED WHEELS

Now, whether you're drilling hard rock or soft shales and gypsum, you can take full advantage of the dependability, versatility and easy maneuverability of the Ingersoll-Rand FM-4 Wagon Drill.

Redesigned for even greater strength and ease of operation, the new FM-4 is available with the famous, hard-slugging Ingersoll-Rand X71WD percussion drill, or with an I-R heavy-duty air motor for rotary drilling with fishtail bits. This rotary unit has proved so successful for soft-ground Wagon Drill work that package "conversion units" are also being offered for use with the previous Model FM-3 as well as the new FM-4 mounting.

Whether used for percussion or rotary drilling, the new FM-4 offers the last word in rugged dependability and flexibility for fast, easy drilling at any angle. Ask your I-R representative for complete information.

Ingersoll-Rand

S-433

11 Broadway, New York 4, New York

CONTRACTORS' COMBINATION

DRIFTERS • JACKDRILLS • JACKHAMMERS • WAGON DRILLS • CARSET BITS • AIR TOOLS • COMPRESSORS

EXPLOSIVES

RESEARCH

PAYS OFF

There's no substitute for the right combination of explosives materials and the "know-how" for getting results that save both time and money. Hercules has specialized in the pioneering of improved explosives techniques for more than 40 years. We will be glad to assist you in selecting the right materials and blasting methods to meet your particular requirements.

HERCULES POWDER COMPANY
INCORPORATED

Explosives Department, 972 King Street, Wilmington 99, Delaware

Birmingham, Ala.; Chicago, Ill.; Duluth, Minn.; Hazleton, Pa.; Joplin, Mo.; Los Angeles, Calif.; New York, N. Y.; Pittsburgh, Pa.; Salt Lake City, Utah; San Francisco, Calif.

XR56-5

Bucyrus-Erie Announces New 5-Ton Model H-3 Hydrocrane 10,000-lb. maximum capacity, 3/8-yd. clamshell

Bucyrus-Erie Hydrocranes have long been noted for big lifting capacity per pound of crane weight. Now the new Model H-3 Hydrocrane — mounted on a lightweight, low-cost truck — gives you 10,000-lb. maximum lifting capacity. And the new Model H-3 retains short tail swing characteristics that have made Hydrocranes standouts on close-quarter work.

In addition, this all-hydraulic, multi-job speedster has many more outstanding new features that put it even farther ahead of ordinary truck cranes.

NEW LOAD INDICATOR WEIGHS EACH LOAD YOU LIFT

A new outstanding safety feature is the load indicator and pressure gauge located at the operator's station. He knows at a glance if the load can be safely lifted at the required radius.

AUTOMATIC OUTRIGGER LEG LOCKS ELIMINATE DOWN DRIFT

Vertical outrigger legs have spring-actuated catches which operate automatically to eliminate outrigger down drift during travel. No chains or snap hooks are needed.

NEW HOUR METER CLOCKS ENGINE WORK HOURS

Better care results from the recording of actual hours of operation . . . makes it easy for the service man to follow recommended protective maintenance program.

NEW IMPROVED THROTTLE CONTROL FOR SMOOTHER OPERATION

Vibration-proof locking throttle control, conveniently located at operator's finger-tips, permits him to set and hold engine at desired speed.

NEW TRUCK BRAKE LOCK

"Mico" electric brake lock holds truck wheels firmly in place while the crane is working.

And this is just the beginning. The new H-3 Hydrocrane has dozens of other new features that will speed your jobs — help you make more money. Get in touch with your Bucyrus-Erie distributor for the full story. 125H56C

BUCYRUS ERIE

BUCYRUS-ERIE COMPANY

SOUTH MILWAUKEE, WISCONSIN

More Work-ability with

The simple, practical design of these "Euc" Scrapers with capacities of 7 and 12 yards struck is years ahead of the field. It brings you a new high in scraper performance and low cost yardage that has made Euclid the fastest growing scraper line in the industry.

Hydraulically controlled lever action provides fast, positive and independent operation of bowl, apron and ejector. Down time and delays caused by cable breakage are completely eliminated. All major components and the entire power train are readily accessible for easy servicing and maintenance.

Have your Euclid Dealer give you facts and figures on the S-7 and S-12 so you can compare them with your present equipment . . . you'll find that ***Euclids are your best investment.***

7 yds. struck . . . 8 yds. at 3:1 slope . . . 9 yds. heaped at 1:1 . . . 18.00 x 25 tires with 21.00 x 25 optional . . . 143 h.p. . . . NoSpin differential . . . non-stop 180° turn in 28 ft.

See you at the ROAD SHOW CHICAGO Jan. 28-Feb. 2, 1957

Easy maneuverability of the S-7 makes it a versatile earth-mover for a wide range of work. Full hydraulic steering permits non-stop turns in only 28 feet . . . enables the unit to get in and out of close quarters. Here a load of topsoil is being spread at a New Jersey housing project.

With its low, wide bowl and adjustable 4-section cutting blade, the S-7 is a fast, easy loader . . . picks up heaped loads without pusher assistance in good materials. This "Euc", equipped with cab, is working on a big land leveling project in the state of Washington.

EUCLID DIVISION GENERAL MOTORS CORPORATION, Cleveland 17, Ohio

S-7 and S-12 "EUC" Scrapers

12 yds. struck... 14 yds. at 3:1 slope ... 16 yds. heaped at 1:1 ... 26.5 x 25 tires ... 218 h.p. .... 9′ 6″ width of cut ... NoSpin differential non-stop 180° turn in 31 ft.

Big 26.5 x 25 tires, NoSpin differential, Euclid planetary drive axle and 218 h.p. engine give the S-12 plenty of power and traction to pick up heaped loads in a hurry. On this Tennessee highway job, the 28 mph top speed with capacity payloads was a big factor in maintaining high production at low cost.

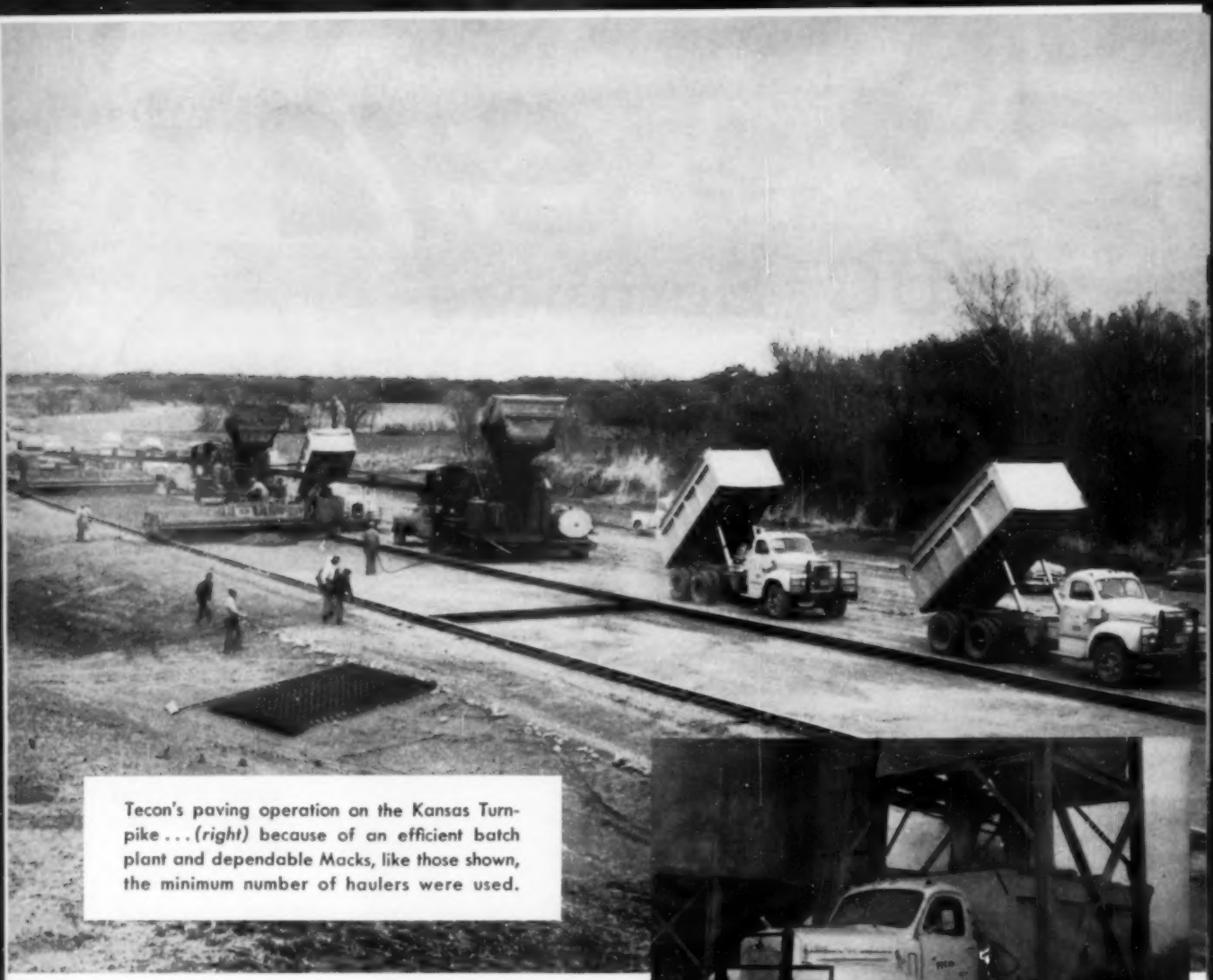
Contractor preference for "Euc" Scrapers results from pay-off performance on the job.

Rugged construction of the S-12 keeps down time to a minimum—it's designed for work on the toughest jobs with big push tractors. Heaped loads of heavy clay—15 yds. and more—were picked up in a short travel distance on this South Carolina railroad grading project.

Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE

EUCLID



Tecon's paving operation on the Kansas Turnpike . . . *(right)* because of an efficient batch plant and dependable Macks, like those shown, the minimum number of haulers were used.

Batch trucks speed Kansas Turnpike paving

. . . as much as 3,000 linear feet of 10-inch, 24-foot pavement in a 10-hour day . . . averaging 2,600 linear feet per day—that's quite a record for two twinbatch pavers working tandem with wire fabric laid on the 7-inch pour of the first paver. To a large extent this efficient paving was due to the trucks hauling the dry batches to the pavers—Mack trucks, each carrying four batches in their compartmented dump bodies.

Mr. S. N. Foster, project manager for The Tecon Paving Company of Dallas, Texas, is all for dependable Mack haulers—and for good reason! Tecon's 12 Mack B-42S dumpers can be depended upon for top performance 10 hours a day, week after week . . . assuring an uninterrupted flow of dry mix to the pavers.

Why not discover for yourself, like Tecon, that when you use Macks, you can do more with fewer trucks . . . more efficiently . . . and at less cost. Get the facts from your Mack Dealer or Representative. Mack Trucks, Inc., Plainfield, New Jersey. In Canada: Mack Trucks of Canada, Ltd. 4429

MACK
first name for
TRUCKS

PARADE OF PROGRESS

the
story
behind

TIGER BRAND WIRE ROPE

AMERICAN STEEL & WIRE DIVISION
USS TRADE MARKS
TIGER BRAND WIRE ROPE
UNITED STATES STEEL

1831-1956
125 YEARS
PEOPLE · PROGRESS · PRODUCTS

Celebrating our 125th Anniversary

From Hoop Skirts.... .to

The first successful wire making enterprise in America was started in 1831 at Worcester, Massachusetts, and became known as Washburn and Moen. This firm produced wire for the woolen industry, for screws and nails and piano wire.

The first big boom in wire making came through a whim in fashion—the hoop skirt—and Washburn and Moen took full advantage of it. They became the leading wire producer in the nation and won a reputation for quality which they never relinquished.

In 1899, during the era of big mergers, Washburn and Moen, along with many other wire making plants, were incorporated into the American Steel and Wire Company of New Jersey, which soon became a part of the United States Steel Corporation.

A few years later, American Steel & Wire began to manufacture wire rope at Trenton, New Jersey and New Haven, Connecticut. This product was highly successful. Production expanded . . . and today American Steel and Wire is the largest producer of wire rope in the world, making more than 1,000 kinds and sizes.

Your closest contact with wire rope may be a daily ride in an elevator. You see it supporting the biggest suspension bridges, and digging coal on mammoth shovels. It is used on the deepest oil wells, on ships and steel mill cranes, for highway guard rails and logging cables. Wire rope and strand are the universal tools for pulling, hauling and transporting man, his goods and materials. Write for our book on Tiger Brand Wire Rope.

AMERICAN STEEL & WIRE DIVISION,
UNITED STATES STEEL CORPORATION, GENERAL OFFICES: CLEVELAND, OHIO
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO · TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA., SOUTHERN DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS AMERICAN TIGER BRAND WIRE ROPE

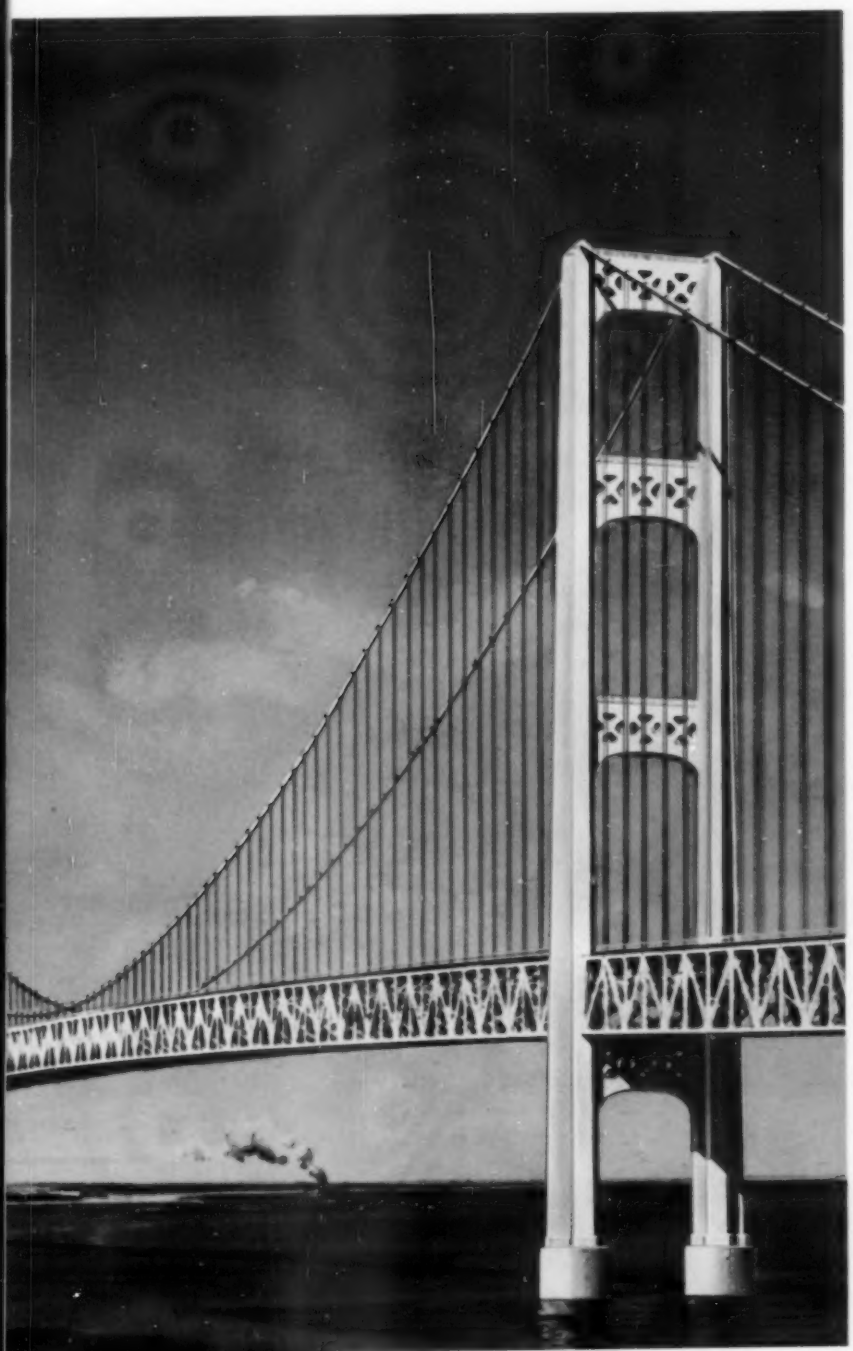
Excelday Preformed

Wall of Stainless Steel Strand
Tiger Brand in one of Chicago's new parking garages. American Steel & Wire springs provide the 1,000-lb. tension to keep the strand taut.

Drilling for Oil in the Gulf of Mexico with a new type of rig equipped with 5,000 feet of Tiger Brand Drilling Line.

UNITED STATES STEEL

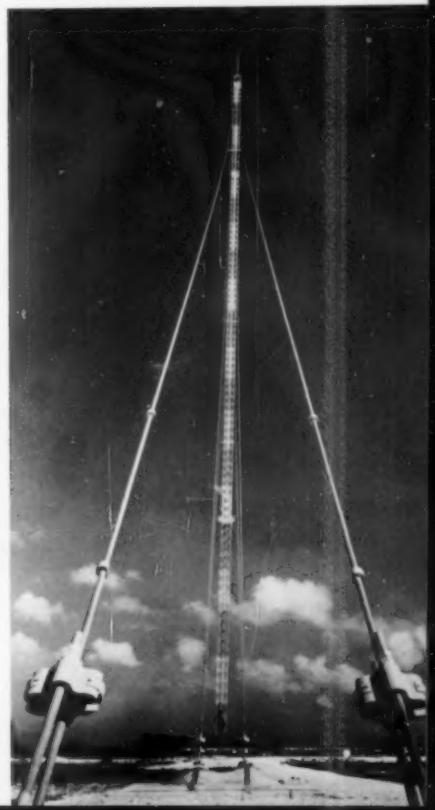
Suspension Bridges



Over 45,000 miles of wire products by American Steel & Wire will be used to complete the Mackinac bridge at St. Ignace, Michigan—longest suspension bridge in the world.

World's Largest Shovel scoops up 60 cubic yards in one bite. Tiger Brand Wire Rope provides the steel "muscles" that make it work.

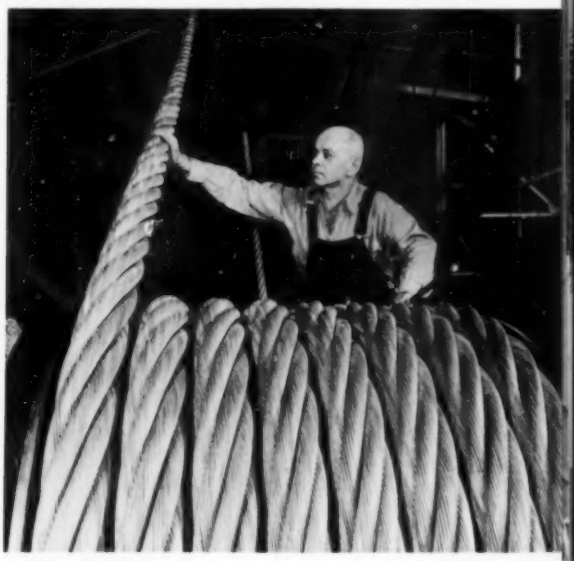
Tall TV Tower for station WGBS-TV in Miami, Florida, must withstand high winds. It is supported by 1⅜" Tiger Brand galvanized strand.



Why Tiger Brand leads . . .

RESEARCH AND ENGINEERING American Steel and Wire has built up one of the finest staffs of wire rope engineers in the country, and in addition can draw from any of the basic research being performed by the United States Steel Corporation. In practice, this means that Tiger Brand Wire Rope is made from the best materials and finest steel being produced. The rope construction is engineered to fit the job . . . and you get a rope that will give the most service at the least cost.

QUALITY CONTROL This means that specified standards of quality are maintained for every step of production from ore to finished product. You can be sure of getting the same high-quality wire rope time after time. The illustration shows an electronic inspection machine, exclusive with American Steel & Wire, that detects if a wire rope imperfection exists, records it on a chart and marks the spot on the rope.



PLANT FACILITIES These are unsurpassed in the industry. American Steel & Wire can make any type and size of wire rope and strand up to the large 4-inch pre-stressed suspension ropes shown here. These ropes are being used on the Pennsylvania-New Jersey Turnpike bridge.

USS AMERICAN TIGER BRAND WIRE ROPE

UNITED STATES STEEL

USS

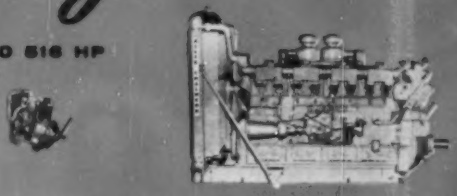
IT'S Allis-Chalmers ENGINES for *any* Power Need

any FUEL

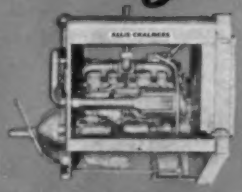
DIESEL . . . GASOLINE
LP GAS . . . NATURAL GAS

any SIZE

8 TO 516 HP



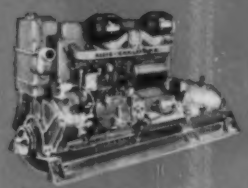
any TYPE



OPEN OR ENCLOSED POWER UNITS

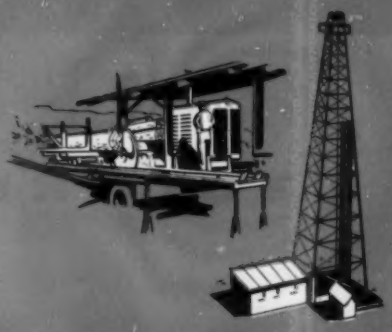
GENERATOR SETS

FAN-TO-FLYWHEEL ENGINES



MARINE ENGINES

any USE



Make your Allis-Chalmers Engine Dealer your main source of power for all your engine needs. He can supply a wide range of engines for any fuel — gasoline, diesel, LP gas, natural gas — for any use . . . stationary or mobile-power units, fan-to-flywheel engines, generating sets or marine engines. Each has the high-efficiency, long-life characteristics necessary for continuous as well as stand-by service. With a high degree of interchangeability of parts, you can use a different type of engine for each application and yet maintain a small stock of parts.

Write for bulletins or see your Allis-Chalmers Engine Dealer for more information.

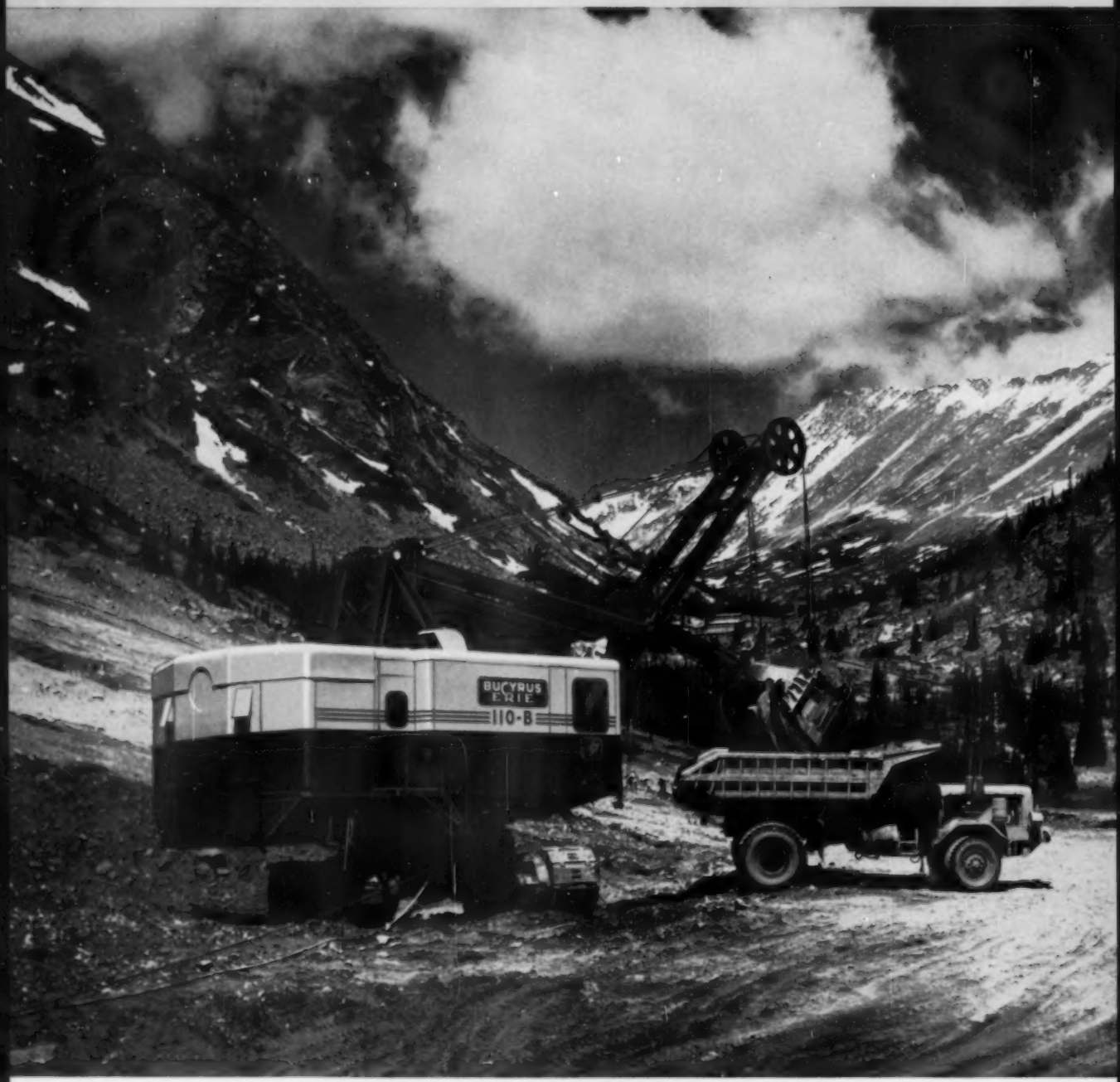
ALLIS-CHALMERS, BUDA DIVISION, MILWAUKEE 1, WISCONSIN

ALLIS-CHALMERS A-C ALLIS-CHALMERS

BE-4

IN COLORADO... And The World Over

ON TOUGH ROCK JOBS LIKE MONTGOMERY DAM



The 110-B strips overburden from a quarry site to get to the rock needed for fill. The spillway crest of the dam will be at 10,861 feet, truly a high-altitude job.

BUCYRUS-ERIE COMPANY

SOUTH MILWAUKEE, WISCONSIN

THE BIG PRODUCERS ARE BUCYRUS-ERIES

Fisher Contracting Co. Selects Bucyrus-Erie 110-B To Load Igneous and Quartzite Rock

It is on jobs like the Montgomery Dam project in Colorado that Bucyrus-Erie's extra margin of design and manufacturing quality shows up. The 110-B Ward Leonard electric shovel shown on these pages is loading out tough, blasted rock to form the embankment of the dam now under construction near Alma, Colorado. This 1,850-ft. long, 108-ft. high rock fill dam will create a reservoir of about 18,000 acre-feet annual capacity to contribute to the Colorado Springs water supply system. The reservoir also will serve the new Air Force academy.

As for nature of the work involved, the Fisher Company's chief mechanic sums it up this way: "This is about the roughest job on equipment I have ever worked on." The site is almost 11,000 feet above sea level and the work involves stripping, shooting, loading and hauling more than 600,000 yards of tough igneous and very dense quartzite rock averaging about 10 tons per dipperful.

Here's where such features as the extremely strong yet lightweight front-end design, coupled with electric power and Ward Leonard control, lets the 110-B handle heavy payloads with steady, output-boosting cycles. In Bucyrus-Erie electric excavators there is plenty of power when and where it's needed . . . Ward Leonard control for extra fast acceleration and deceleration . . . heavy-duty construction for long machine life, low maintenance costs.

When you are planning jobs, particularly those involving big yardages, extra tough materials or conditions, plan on the excavators that offer the extra margin of quality you need to protect your profits. Plan on Bucyrus-Eries. Choose from three models — the 4½-yd. 110-B, 6-yd. 150-B or 8-yd. 190-B. Full information will be sent on request.

B6156C

Here's where extra stamina pays off. A granite boulder is eased into the hauling unit — just barely big enough to accommodate it.

About ten tons per swing . . . and highly abrasive rock too! The advantages of extra power and speed with low maintenance, built into every Bucyrus-Erie excavator, make a real difference on jobs like this.

BUCYRUS ERIE

Excavating Engineer

founded 1905 NOVEMBER, 1956

Steep Rock Lake's Middle Arm has been dewatered to permit open pit mining of its rich iron ore. Trees indicate old shore line.

Canada's Growing Iron Ore Giant

ABOUT 140 miles west of Port Arthur, Ont., in the wilderness of forest, lakes and rivers above Lake Superior, one of Canada's richest iron ore properties will produce 3¼ million tons of direct-shipping grade ore this year.

Steep Rock Iron Mines, Ltd., Atikokan, Ont., has been digging hematite ore from the vast, deep dewatered basin of Steep Rock Lake for the last 12 years. Its holdings cover some 7,000 acres, all of which are owned in fee.

Since the company began mining operations in August 1944, it has produced and sold about 13.6 million tons of high grade ore, principally in United States markets. Shipments for the first full year of operation were slightly more than 500,000 tons. Annual production since then has grown steadily.

During 1955, the mining firm advanced to sixth place in the rank of ore producers in the Lake Superior region with an output of 2,265,000 tons. Within a few years, production of Steep Rock

Output of Canada's largest iron ore producer is growing by leaps and bounds. Large, modern equipment spread, including new rotary blast hole drills, is geared to handle big yardage.

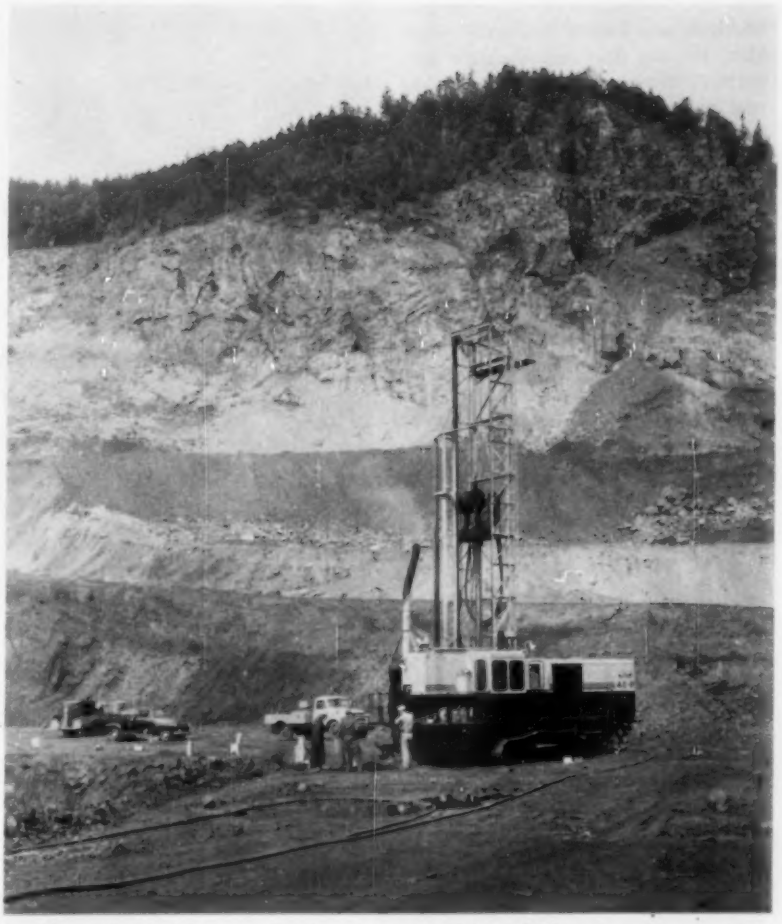
Mines and its leased properties is expected to be more than 8 million tons per year.

Importance of the Steep Rock range in the Lake Superior supply picture is certain to grow. Reserves of high-grade ores are running out on Minnesota's giant Mesabi range, which has been the raw material backbone of the United States steel industry for half a century.

The Steep Rock range has many millions of tons of ore mineable by open pit and underground methods. The range has seven miles of contact zone where iron ore is indicated. Estimated ore reserves to 1,000 feet of depth total 288 million tons, including a large tonnage in another area of the lake basin leased to Caland Ore Co., a subsidiary of Inland Steel Co., Chicago, Ill.

The quarter-billion ton figure represents about one-sixth of the total reserves of direct-shipping ore and concentrates that can be produced by methods now in commercial use on Lake Superior iron ranges. On the basis of the reserve estimates, which are only to a depth of 1,000 feet, Steep Rock Mines and Caland Ore will be capable of producing at the projected 8 million ton figure for about 35 years.

The orebody which Steep Rock Mines has currently developed is approximately three miles long and 100 to 400 feet wide. Its depth for mining purposes is unlimited. In diamond drilling, ore has been intersected at 2,100 feet below the lake bed.



Working under a high face of rock, a rotary blast hole drill prepares an ore bank. The electric-powered unit, which drills 7⅞-in. diameter holes, is one of two at mine.

A 4½-yd. electric shovel loads sticky ore to a dump truck in the Hogarth pit.

The fact that the mines at Steep Rock are located on a lake bottom is an unusual, though not unique occurrence. Several Mesabi range mines, including the Embarass mine of Pickands Mather & Co., Biwabik, Minn., have been developed by pumping a lake dry. The size of the job at Steep Rock was so formidable, however, that the whole project was considered by many people to be an economic gamble from the start.

The draining of Steep Rock Lake is one of the largest pumping projects ever undertaken. The lake consists of three arms or bays which form the shape of the letter M. These bays are known as the Middle, East and West arms. The Middle Arm, in which Steep Rock Mines operations are located, has been completely unwatered except for a small section where hydraulic stripping is in progress. The East Arm is presently being pumped out by the Caland Ore Co. Still to be developed is the West Arm, which Steep Rock Mines is using as a settling basin for the discharge material of its hydraulic stripping. The West arm may eventually be developed also.

Develop Middle Arm

To bring into production the Middle Arm, which is the shallowest of the three, Steep Rock Mines drew out from the basin some 118 billion gallons of water, plus an annual rainfall of about 5 billion gallons. The task also required as a preliminary the diversion of a river and the drainage by means of cuts and tunnels of several other large lakes. The job of drying up the East Arm is an even larger task than the Middle Arm—more than 180 billion gallons will be pumped.

Exploration of the Steep Rock range did not take place until the late 1930's,

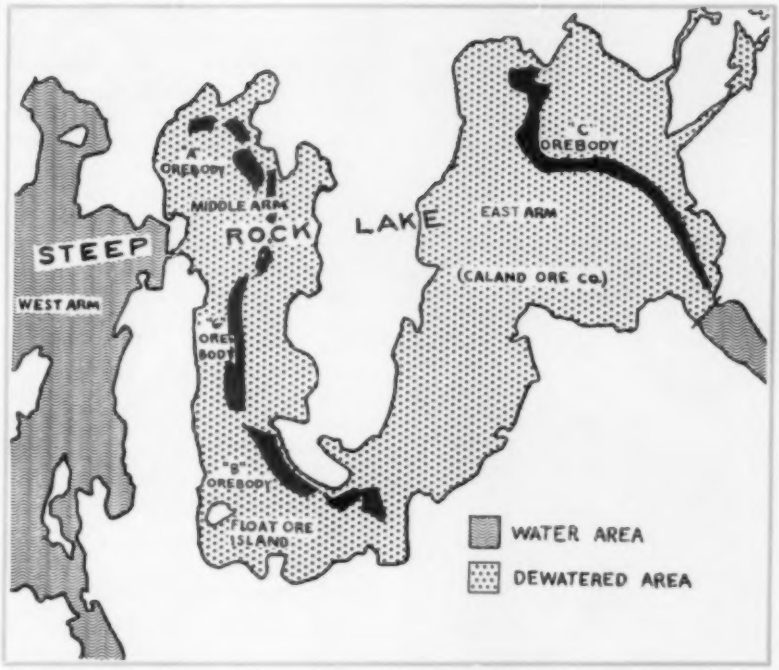
although the presence of ore in the lake area had been known for many years. Rich iron ore float and boulders were scattered along the shoreline and the bush country to the south of the lake. Prospectors unsuccessfully searched the surrounding areas of Steep Rock during the early part of the century. No attempt to explore for iron in the lake itself was made because it was from 70 to 300 feet deep and because the course of the Seine River flowed through it.

Finally in 1938, Julian G. Cross, a mining engineer and prospector from Port Arthur, and Joseph Errington, a prominent Canadian mining figure, successfully located an important high grade deposit beneath the bed of Steep Rock Lake. Incorporation of Steep Rock Mines followed in 1939. Hugh M. Roberts, consulting geologist, and Watkin Samuel, consulting engineer, assisted in the early exploration and development of the property. Major General D. M. Hogarth, who had been associated with Errington in other mining ventures, took over direction of the company in 1942, after Errington's death.

The huge, complex river diversion task began in 1943 when the general

A mobile crane removes a dredge anchor from the storage yard of Construction Aggregates Corp. The 25-ton utility crane handles pipe and machinery for contractor.

Lake-bottom silt covering the "G" iron ore zone is being excavated by one of two 30-in. electric dredges, the *Steep Rock*.



Drawing indicates proportions of Steep Rock Lake. East Arm is being dredged of clay silt; mining is under way in Middle Arm; West Arm remains undeveloped.

contracting firm of C. A. Pitts, Toronto, Ont., began construction of the numerous facilities required. These included dams, cofferdams, channel excavation, land clearing, roadbuilding and digging of a 1,200 ft. long, 10 by 12-ft. water syphon tunnel through solid rock.

Pumping operations were handled by the mining firm itself. Two 24-in. pumping units were put into operation in December 1943. More pumps were added until a total of 14 was reached. The pumping plant had a maximum capacity greater than the pumping capacity of facilities used to supply water to Canada's 14 largest cities.

Remove Lake-Bottom Silt

After the bulk of the water had been removed, the "B" ore zone, one of three in the Middle Arm, was exposed. Removal of heavy overburden, including clay-silt, boulder clay and rock followed. The depth of silt overlying the area varied from a few feet to 100 feet.

Because of the clayey nature of the material, conventional mechanical excavating equipment was ruled out. It was decided to disintegrate the overburden with high pressure hydraulic monitors and to pump the slurry of water and clay by means of suction dredges to disposal points. Two 15-in. dredges worked seven years, beginning in 1944, to strip completely the "B" ore zone, which became the Errington open pit mine.

Essentially, the same methods were used to expose the "A" orebody at the northern end of the Middle Arm. Because the greater depths and larger quantities involved required larger equipment, Steep Rock Mines purchased two large 30-in. electric suction dredges, the *Steep Rock* and *Marmion*. Each of these giants was capable of excavating up to 1½ million cubic yards per month.

Starting in 1951 and working night and day through all seasons of the year until December 1954, the pair of dredges moved approximately 55 million yards of material so that trucks and shovels could begin mining the "A" zone of the Hogarth open pit.

During the winter of 1954, the two machines, weighing 1,000 tons each, were transported intact overland two miles to the "G" ore zone lying between the Hogarth and Errington pits. The units are now removing an additional 50 million yards of silt from the new zone. Hydraulic stripping operations are in charge of the Construction Aggregates Corp., Chicago, Ill. Clyde (Boots) Davis is job superintendent.

In the East Arm of the lake, where a 1,250-acre section has been leased to Caland Ore Co., Construction Aggregates also has contracted to strip the "C" orebody. About 160 million yards of overburden will be removed. Mining is scheduled for 1960, according to present plans. The Construction Aggregates firm has employed there the two largest electric hydraulic dredges in the world. The 36-in. units are the *Clarence B.*

A Euclid TS-18 twin-engined scraper fills its bowl with overburden which is hauled a half-mile to disposal point. The waste is dumped in the abandoned Errington pit.

(Above) Rotary and churn units drill ore banks. (Below) A TD-24 cleans up around a 6-yd. P&H 1600 shovel. Drills and shovels work simultaneously on several levels.

Randall and the *Joseph L. Block*, respectively named in honor of the chairman of the board and the president of Inland Steel Co. at the time the dredges were launched.

The dredges have been working on the job for two years and have three to go. Two 42-in. pipelines mounted on pontoons carry mud and water from the dredges a distance of three miles to disposal points. Phil Pearson is manager of the Caland firm. Bud Whitman is chief engineer.

To move some 4 million yards of material, including overburden, in the 1956 mining and stripping program, Steep Rock Mines has made a big investment in excavators, drills and hauling equipment.

In the power shovel lineup are a P&H 1600 electric with 6-yd. dipper; two P&H 1400's with 4½-yd. dippers; three 2½-yd. Northwest Model 80-D's; and one Model 41 with 1-yd. dipper. There are also two Model 80-D's with crane-type front end equipment.

The job of handling 18,250 tons of ore per day, plus 11,000 cubic yards waste material, is assigned to a truck fleet of 12 34-ton Euclids which are torque converter equipped; 14 34-ton Macks; and four 22-ton Euclids. Tractor equipment used for cleanup around shovels and various leveling jobs include six International TD-24's, two TD-9's and two Caterpillar D8's.

Lighter truck equipment includes two International 4 x 4's; two Fargo Powerwagons; 11 Ford and GMC ¾-ton trucks; and two International dump trucks.

Road maintenance is handled by a Galion 600 motor grader and an Allis-Chalmers Model D grader. International Harvester tractor and truck equipment and Bucyrus-Erie drilling equipment were purchased through Twin City Industrial Equipment, Ltd., Port Arthur, Ont.

New Drilling Program

Churn-type 29-T blast hole drills were used exclusively by Steep Rock Mines until last year. The firm had accumulated a total of 10 of these drills since 1944. In the fall of 1955, the company converted to a modernized high-speed drilling program with the purchase of a Bucyrus-Erie 40-R rotary drill unit which is electrically powered.

The 40-R's purchase was something in the nature of an experiment—one

Here is part of the old drill fleet which has been largely replaced. Two rotaries now do the work of eight churn machines.

which has worked out well. The machine has effectively replaced four of the churn drills. A second 40-R has since been added.

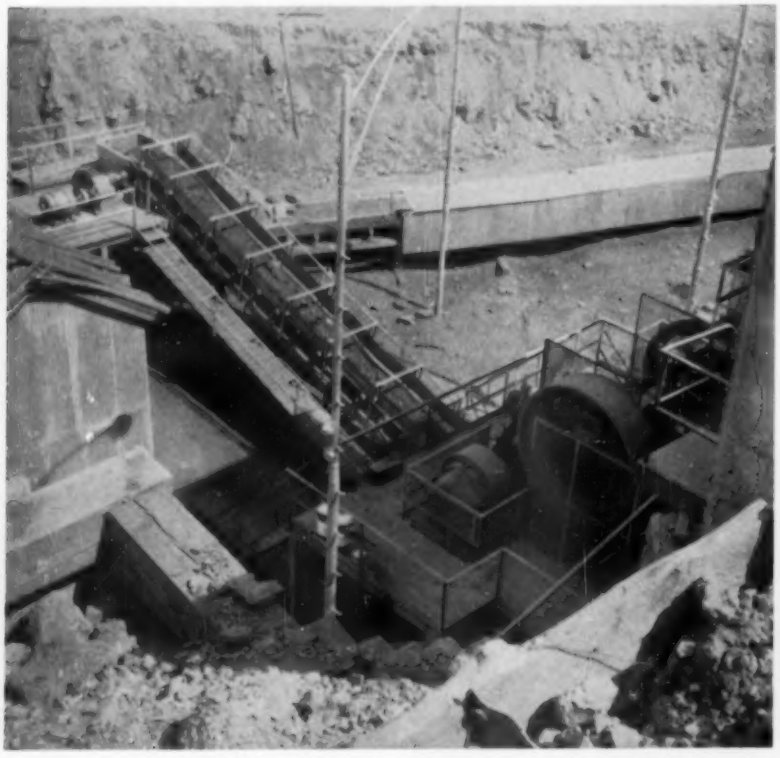
The bench layout at Steep Rock attempts to keep average bench depth at 25 feet, according to Ray Andrecheck, superintendent of the Hogarth mine. Blast holes are drilled to 27-ft. depth by the 40-R rotary drills, providing a 2-ft. hole subgrade.

"The 40-R gives better bottom break than churn drills," Andrecheck said. "In wet holes with churn drills you can't get all the sludge out of the hole and powder floats on top of the sludge. With a rotary drill like the 40-R drilling a 25-ft. hole, you get a full 25-ft. cut because you can use compressed air to blow water and fines out of the hole. You have to drill 32 feet of hole with a churn drill to get a usable 25-ft. of hole."

Extra pipe sections can be added with

(Right) Hole loading operations are supervised by Swen Knutsen, day shift foreman, and Tom Heale, general foreman.

(Above) A truck load of ore is dumped through gates of hopper above grizzly screen. (Below) A 48 x 60-in. Allis-Chalmers jaw crusher reduces the oversize to minus 8-inch.



a small loss of drilling time, since everything is done on the drill by power. A special tool rack on the machine provides storage for four drill pipes. When a drill pipe is selected for addition to the pipe string, it is swung into position above the hole and screwed on to the rotary drive machinery and pipe sections already in the hole, all under power. The process is reversed to remove the extra pipe section when the hole is completed.

Blast holes 7⅞ inches in diameter are drilled on 16-ft. square spacing. The distances are measured off at five paces. Most shots put off are small, using several thousand pounds of explosives. The largest single shot to date took place in the winter of 1955 when 350 holes loaded with 65,000 pounds of powder were set off.

Use Canned Powder

The basic explosive is 6-in. canned Nitrone powder with 5-in. primer. Nitrone is manufactured by Canadian Industries, Ltd., Beloeil, Inc. Three cans of powder and two cans of primer are used in a typical 27-ft. hole. CIL Wirebound primer cord is used for firing.

In wet holes, box powder CIL Giant gelatin 25% strength is used. This type of explosive is packaged in 6 x 16-in. paper cartridges.

According to Tom Heale, general foreman of the Hogarth pit, the canned Nitrone has worked out well with the rotary. Holes produced by rotary drilling are smooth-sided and allow full contact between the cans. The cans must touch

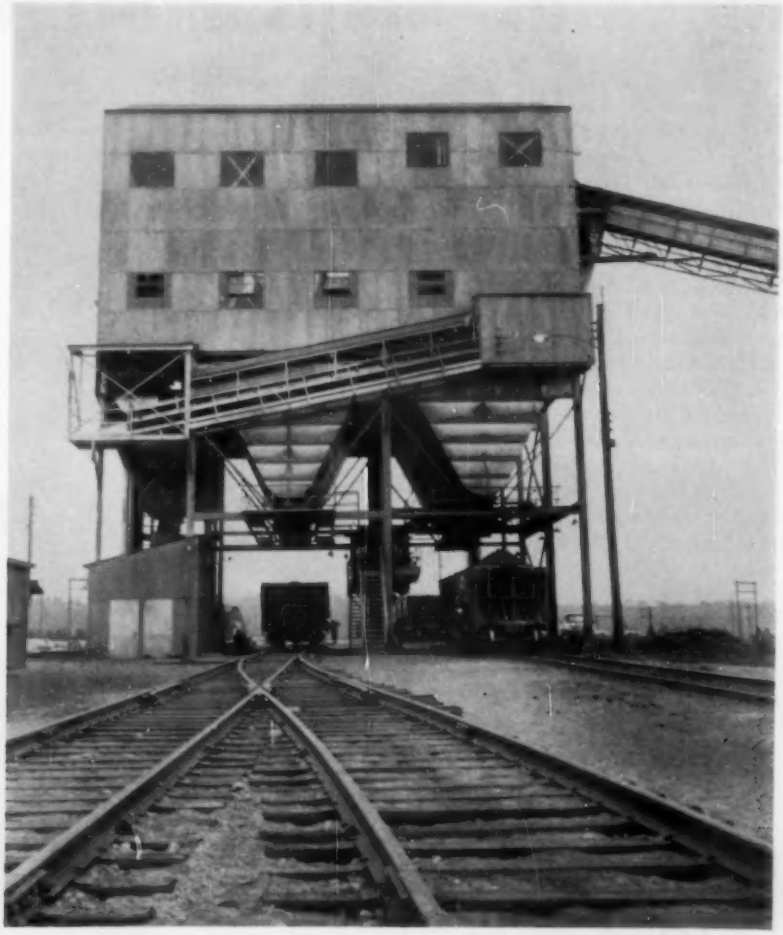
Pit-bottom location of the crushing and screening plant requires only a short haul from ore banks. Capacity is 1,500 tons per hour.

each other to explode because the powder is insentitive. However, in wet holes, the cans won't sink and consequently paper-wrapped powder must be loaded.

The overall powder factor for all types of material runs one-half pound of explosive per yard of material broken. In ore the factor is about one pound per yard.

During the five-day week of June 4-9 preceding *Excavating Engineer's* visit to Steep Rock, the first 40-R drilled a total of 3,349 feet of hole in iron ore,

Continued on page 64



(Left) A 4,200-ft. long conveyor lifts crushed material on 36-in. belt from pit bottom to surface. (Above) At loading terminal, ore is screened and loaded into cars.

Excavator at right stockpiles lime rock from pit. Other two machines load it into dumps for hauling to the crusher.

Meekins Helps Florida's Growth

A Model-T Ford, a pick and a shovel: those were Clifton Meekins' tools when he started in the sand and lime rock business 34 years ago in Hollywood, Fla. His wife, Edith, kept books.

Today, Meekins, Inc., a large producer of concrete, concrete blocks and aggregates, is sharing in Florida's building boom. Last year the Hollywood plant batched out 152,000 cubic yards of concrete and manufactured 3½ million 7⅝-in. concrete blocks.

Meekins operates two plants, which are supplied with material from two pits. The main plant and pit have been located on the same 200-acre site that Clifton Meekins first spaded in 1922, 15 miles north of Miami between Hollywood and Hallandale.

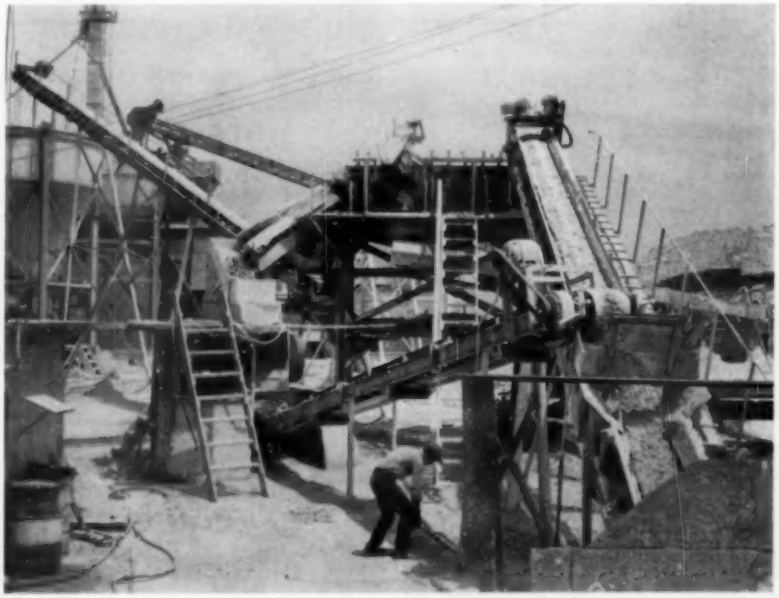
Capacity of the Butler batch plant at the Hollywood site is 1,400 yards per 10-hour day. The plant recently was converted to automatic production. Two Go-Corp Seniors can produce 15,000 concrete blocks per day.

A second plant, with a capacity of 75 yards an hour, was opened last spring at Fort Lauderdale. At the time of *Excavating Engineer's* visit to Meekins' operations last spring, sand and rock for the Fort Lauderdale plant were being purchased. By this time, materials for that plant probably are coming from Meekins' new pit located north of Pompano.

Meekins figures that the Pompano pit, which is located on a 180-acre site, will produce economically for 20 years. A Bucyrus-Erie 54-B with a 2½-yd. dragline bucket was digging test holes there in April. It was moving between 2,000 and 3,000 yards a day. An International TD-24 dozer was leveling.

Since starting concrete block production in 1952, the Hollywood plant has produced 15 million of them. The com-

Business prospers for sand and lime rock firm founded in 1922 with pick, shovel.



Looking from the hopper, here is the crushing setup. Meekins' Hollywood plant in 1955 batched out 152,000 yards of concrete and made 3½ million concrete blocks.

Clifton Meekins founded business 34 years ago with Model T, pick, shovel.

pany said that it ranked in the country's top 10 concrete block producers.

The customer at the time each 5 millionth block is produced receives a gift, usually a free load of 300 blocks, to mark the occasion. A gold-painted concrete block lettered with the figure 15,000,000 rests on a shelf in Meekins' laboratory.

Production at the Hollywood plant includes transit-mixed concrete, concrete blocks, concrete rock (maximum of 1 inch down to No. 4), pea rock (⅜-in. maximum down to No. 8), rock screens and mason sand.

Meekins delivers concrete in its 34 mixers (all 7-yd. Rexes and Jaegers mounted on Mack and Reo trucks) within a 15-mile radius of Hollywood. The batch plant can load out a truck in from 2 to 2½ minutes.

To keep abreast of the booming block business, Meekins delivers blocks in 12 Mack trucks, which are among the nearly 100 pieces of rolling equipment the company maintains. All of Meekins trucks are dispatched by radio. The principal Motorola unit is located at the Hollywood plant.

Meekins expects its Hollywood pit to produce for another five years, when it

Continued on page 60

A ½-yd. Koehring 205 (right) and a ¾-yd. Bucyrus-Erie 22-B (center) load out lime rock which the 1½-yd. machine (bottom) takes from pit and stockpiles.

Dumping unit at right hauls glacial till from site of Iroquois Lock, the destination of the truck with concrete bucket.

Canadians Progress on Seaway Construction

STRUCTURES are rising as work enters the second phase of the five-year schedule on the St. Lawrence Seaway and Power projects, a joint $900 million undertaking of federal, provincial and state agencies from Canada and the United States.

Excavating Engineer (January 1956) already has visited the American operations, which are centered around Massena and Ogdensburg, N. Y. Most of the work at that time involved planning, design and the excavation of foundations, canals and ditches. Now, however, the structures are taking form, although much excavation still is required. This is true also of the Canadian Seaway and Power works, which stretch from the Welland Canal to Montreal.

Review of Progress

A brief review of progress on the Canadian Seaway operations has been reported by the St. Lawrence Seaway Authority's president, Lionel Chevrier.

Miles of channel in the Lachine section remain to be excavated. Dredging of the Seaway entrance at Montreal harbor and of the channel in reaches of lakes St. Louis and St. Francis and elsewhere will continue for two more years.

Miles of these channels already have been excavated. Several minor contracts and one major one have been completed in the Lachine section. One of three dredging contracts in Lake St. Francis has been completed. Of the three contracts by which the Authority is enlarging part of the Welland Ship Canal to provide the Seaway depth of 27 feet, one is completed.

The Authority must provide all of the facilities in the Lachine section, 31 miles in extent; in the Soulanges section, 16 miles; in the Lake St. Francis section, 29 miles; and in the Welland section, 27 miles. (In the Welland section, this entails deepening 11 miles of the Welland Ship Canal to 27 feet, from approximately 25 feet.) In the Soulanges section, the Authority will use the Beauharnois Canal already in existence, and is building two single locks for access to this canal.

Much To Do

The Authority has much work to do in the International Rapids Section, including the construction of the Iroquois Lock, westernmost of seven locks on the Seaway. The United States is constructing two locks and the Long Sault Canal near Massena. The major works for the production of hydro-electric power are being built in the International Rapids section, including the Barnhart Powerhouse and the Long Sault Dam.

The Iroquois Lock is one of five which the St. Lawrence Seaway Authority is building. The $6,470,000 contract is to be completed by Nov. 30, 1957. Some 6,600 feet long, the lock requires the excavation of about 4,500,000 cubic yards, mostly heavy glacial till. Over half of this part of the work has been completed, to which a hole over 100 feet wide and 90 feet deep bears testimony. The contract is held by Pentagon Construction Co. and Iroquois Constructors.

Power shovels and 22-ton trucks are now clearing the downstream approach to the lock. Meanwhile, the upper entrance wall to the lock grows longer and higher. A 275-ton gantry crane, aided by a smaller crawler crane, swing 10-ton buckets of concrete from trucks to the pouring crew. The structure will require 600,000 tons of concrete which will come from a mixing plant located adjacent to the excavation. A nearby quarry supplies the aggregate.

The upstream approach or entrance wall will extend more than 3,000 feet when completed. Over half of it has been built to its final height of 47 feet. It is six feet wide at the top and 34 feet wide at the foot.

The actual lock structure will be more than 1,300 feet long and will provide a lock to Seaway dimensions of 800 feet long and 80 feet wide with 30 feet over the lock sills.

Two Beauharnois Locks

At Beauharnois, the Authority is building two locks—upper and lower—for access between Lake St. Louis and the navigation channel of the Beauharnois Power Canal. Contracts were awarded June 15, and the work is in the excavation stage. The job also entails the construction of a downstream approach from Lake St. Louis and an upstream approach from the Beauharnois Canal. Excavation for a four-lane highway tunnel under the site of the future Lower Beauharnois Lock is progressing.

Concrete for two locks—the Cote Ste.

Structures are rising as work enters second phase of the five-year schedule. Much excavation remains, however. One major, several minor contracts have been completed in Lachine area.

Catherine and the St. Lambert—is rising in the Lachine section. Methods for placing concrete at these locks differ from each other and from Iroquois Lock. At Cote Ste. Catherine Lock, tall, slender gantries swing concrete buckets of approximately 1-yd. capacity. Mixer trucks bring the concrete from the plant and pour it into the buckets, which are then lifted over the forms.

Canamont Construction, Ltd., and Canit Construction, Ltd., both of Montreal, hold the $7,107,480 contract for construction of the Cote Ste. Catherine Lock.

10,500 Lineal Feet

The work extends 10,500 lineal feet. Included in the contract are the excavation of a turning basin downstream from the lock, the construction of regulating works for the control of the water level of the upper reach of the canal, and the formation of a reservoir pool upstream from the lock.

The 30-ft. lift of this lock will overcome the major fall of water in the Lachine Rapids.

Seven miles downstream, the first Seaway lock is being built at St. Lambert, on the south shore of the St. Lawrence opposite Montreal. The lock will raise or lower ships 15 feet between the level of the Seaway entrance and the Laprairie channel.

The downstream approach walls of this lock are taking definite shape below Montreal's Victoria Bridge, which crosses the Seaway channel just below the site of the main St. Lambert Lock structure.

Two methods are being used to place concrete here. Approach walls are being built by pouring concrete into the forms from spouts on the rear of concrete trucks. The monoliths are being built of reinforced concrete being placed by a tracked stacker fed by a conveyor belt from the mixing plant.

$7.4 Million Contract

The St. Lambert Lock is being built by the firms of McNamara Construction Co., Pigott Construction Co., and Peacock & McQuigge Ltd. The contract is valued at $7,399,472.

About 2,400,000 yards of material had to be excavated for the lock. The concrete work will require the use of more than 2 million bags of cement. A water intake for the city of St. Lambert is included in the contract.

Completion dates for the structure contracts are late 1957 and 1958.

Here Are Nine Quick, Sure Ways to Ruin Drill Steel

WANT to know the nine fastest and "best" ways to ruin good drill steels? Here is the list, as prepared by Atlas Copco Eastern, Inc., Paterson, N. J., a manufacturer of rock drills and other pneumatic equipment for mining, quarrying and construction work:

1. Storing steels in the open. Rain, snow and normal dampness will rust both the exterior and center hole of steel, leaving a rough surface particularly susceptible to metal fatigue.

2. Handling steels roughly during transportation. Deep scratches on the outer surface quickly become major structural weaknesses. (For identification purposes, stamp a number into a steel. This makes it easy to find and insures extra speedy breakage.)

3. Forgetting to regrind the steel. That tough tungsten carbide insert will lose its original cutting potential and then the rock drill will damage the rod instead of the rock. You'll crush the insert.

4. Ignoring instructions for grinding steels. Grind the bit just as sharply as you can. Then, while it's still hot, dip it into a bucket of cold water. This is always good for a laugh—and early breakage.

5. Running your drill with too little pressure on the steel. This will make the drill jump on the steel's collar and keep the piston from hitting the steel. It develops particularly high stresses on the rod.

6. Using the pusher with too much force. This helps bend the drill steel, making it break early in the game.

7. Using a rock drill with worn-out rotation device. If the steel doesn't rotate with each blow, it will suffer heavy stresses on both the rod and bit. This means early breakage.

8. Using worn-out checks and pistons in the drill. This is probably the best way to ruin the shank of your drill steel. That's because the shank will have a tilted position in the rock drill and the piston will hit only one side of its surface. After running your drill a while, the steel's shank will look like a rivet head.

9. Using your steels for scaling. For outright ruin of a good drill steel in the shortest possible time, you just can't beat this method.

California Builds Bayshore Freeway

by R. H. Harnett

PERHAPS there is no body of water in the world adorned with as many engineering masterpieces as San Francisco Bay.

Golden Gate Bridge, standing majestically at the entrance of the bay, is the longest single-span bridge in the world. The San Francisco-Oakland Bay Bridge is likewise one of the engineering wonders of the world. Treasure Island is a man-made island with a bustling naval base. Alcatraz is a natural island—it also contains government facilities. There are also half a dozen other large bridges in the area.

Several projects, when they are built, are destined to take a place with these, including a proposed earth barrier across the top of the bay that would make it a fresh-water lake, and a new San Francisco-Oakland bridge and tube crossing now in the planning stage.

Two "experimental" parts of the fill for San Francisco's Bayshore Freeway are shown. Test fills were made to check feasibility of placing fill in deep San Francisco Bay.

Topography Will Change

Work which will change the bay's topography now is in progress. This project, sponsored by the state of California, is the open-water fill extension of Lick Memorial Freeway. Commonly called the Bayshore Freeway, the Lick Memorial is the chief arterial highway by which a quarter of a million persons daily go to work in San Francisco and Oakland from "bedroom" counties in the southern part of the San Francisco peninsula.

The freeway, planned in the 1940's, is nearing completion. Construction is under way at present on several sections of it, including the open-water fill.

A six-lane highway will be laid down over the completed fill early next year. Then motorists will have clear sailing from the center of downtown San Francisco to the heart of outlying residential areas. The earth and rock bar across the bay will be wide enough for two more lanes to be added later.

Highway engineers were faced with a problem of staggering proportions in mapping the route for the Bayshore Freeway. The San Francisco peninsula is only a few miles wide. Surrounded on three sides by water, it is barricaded across its middle by hills and mountains. Residential and industrial development already covered nearly every available inch of land.

The freeway route was laid down in 1941. Some observers may have thought it odd to see a three-mile band across an arm of bay water designated officially as "freeway" on the maps. But California state highway commission engineers had searched in vain for a land routing through a heavily congested section of the peninsula just south of the San Francisco city limits.

Comprehensive studies were made to

Open-water fill extension of Lick Memorial Freeway across arm of San Francisco Bay will help speed traffic into San Francisco and Oakland. Earth, rock fill dumped to depths of 80-90 feet.

determine the most feasible and economic method of crossing the bay arm. The possibility of a causeway was eliminated. Highway department engineers then considered dredging the bay-bottom mud, which ranges up to 90 feet deep, into an embankment. Because of the great depth of the mud and its instability, however, the engineers decided on a filled crossing—if it could be built. To prepare approaches for any kind of crossing, a large amount of earth and rock had to be moved anyway, and there were large amounts of excellent borrow material in nearby hills.

For these reasons, a decision to use the end-dump fill method was made. This method of construction had never been used on such large scale with the dimensions and conditions present here. Some experts doubted that the fill would succeed because of the extremely muddy bottom of the bay.

To determine the feasibility, a test fill was contracted for in January 1952. The contract went to the Edward Keeble Co., San Jose, Calif., and the work began February 1. The experimental fill was completed that August with a total of 400,000 yards of material dumped into the bay from the northern Candlestick Point end. The roadway then extended .3 mile southward into the bay. The contract was worth $160,000.

The Keeble firm used 20-yd. Carryalls and LeTourneau-Westinghouse Tournapulls. The fill was advanced on a 400-ft. wide front in an attempt to float the fill with a minimum of mud displacement. As the fill progressed, however, borings indicated that much greater penetration and displacement of mud was occurring than had been estimated. Calculations showed that this greater penetration would allow the width of the roadway to be reduced and still obtain stability. The fill then was narrowed to 300 feet. Later, it was found that narrowing of the roadway forced the earth bar down even deeper into the mud. This would again make for more solidarity, and it was decided to narrow the road further to 250 feet. That was the width of the point in the water when the experimental contract was completed.

The work seemed to be going along fine at that point. The water crossing could have been completed by simply continuing the progress — except for one fact: the deepest mud encountered in the experimental fill was 40 feet. Farther out in the bay tests had shown that the mud reached to depths of 80 to 90 feet.

Franciscan sandstone, the borrow material for the project, is loaded into dumps by a 6-yd. shovel (foreground) and a 4-yd. shovel. Fill total was nearly 3 million yards.

Two-Mile Haul Road

A second experimental contract for $860,000 was let in June 1953 to the Guy F. Atkinson Co., South San Francisco, for 950,000 yards of fill to be dumped into the bay at the deepest part of the overwater route. To carry out this part of the project, the Atkinson firm had to build a two-mile haul road from a borrow site on the west side of the existing Bayshore Highway. That haul road went under the highway, using an existing underpass. The Atkinson firm built, specifically for the haul road, an overpass over eight Southern Pacific Railroad tracks. The haul road also required its own embankment fill extending 1,200 feet into the bay at right angles to the direction of the freeway route. This approach road was built 30 feet wide, allowing just enough space for big dump trucks to pass. It pushed down as far as 60 feet into the soft bay bottom and was a good miniature of the main project, proving stable under the pounding of heavy trucks and against the washing tides.

Nearly 3 million yards of fill material have been hauled over the haul road by Atkinson's fleet of 20 15-yd. Euclid and Kenworth dumps, with only normal grading for maintenance. In the latest and final fill activity, 560,000 yards were being moved, with a truck crossing over the haul road overpass every 25 seconds, 14 hours a day.

The second fill contract was to have been a further experiment to test feasibility of the project. The Atkinson company's success in building the auxiliary haul road fill was so encouraging to highway engineers that the main purpose of this contract became not whether the fill could be made, but how it could be done most efficiently.

The fill was like a bar, pressing down-

A Bucyrus-Erie 22-B Transit Crane is used to pour concrete for a bridge footing.

As traffic moves along the Bay, a 4-yd. shovel loads borrow to a dump for hauling to the fill that eventually will provide a fast, six-lane highway into San Francisco.

ward and forward into the thick, soft mud of the bay bottom. The problem was to proceed with the fill in such a way that the downward and forward forces resulted in an even and solid foundation for the highway.

While Atkinson was completing this contract in the early part of 1954, Division of Highways engineers drew up specifications for the third fill contract. They outlined the shape of the advancing face of the embankment and gave instructions on how to compensate for the daily tidal changes and varying depths of water and mud.

In the earlier work, it had been found that continuity of work was very important in the fill operation. Stoppages caused serious changes in the depth of mud displacement when work was resumed. In the next contract, the highway division ordered blasting of underwater mud to start it moving again after any stoppage of more than 10 hours.

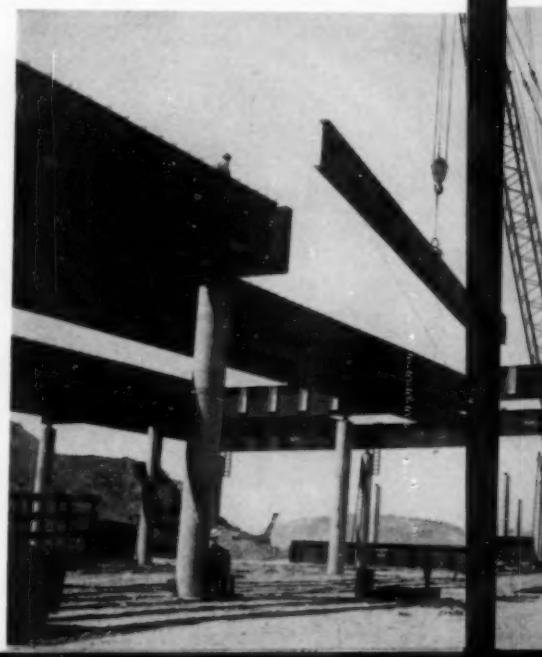
In August 1954, the Atkinson Company obtained a third contract for $1.6 million. It called for 1,950,000 yards of open-water fill.

An Atkinson spokesman said that the mud blasting, when necessary, was accomplished by a "jet" system whereby the explosive charge was placed 30 to 40 feet into the bay mud.

Fortunately for the fill project, the borrow material from nearby hills was all of the same material, called Franciscan sandstone. The sandstone is a sedimentary formation fractured and twisted by the many prehistoric upheavals in the surface of the earth in this area of the Pacific Coast. Being a rocky material, however, it had to be drilled and shot before two Bucyrus-Erie 150-B electric 6-yd. shovels and one 2½-yd. 80-D Northwest shovel went to work. A 4-yd. Bucyrus-Erie 88-B also was used.

The blast-hole drilling at the borrow site was handled by three large Joy drills with air supplied by three 600-cfm Gardner-Denver compressors. Also used were wagon-drills, jackhammers and supplementary air equipment.

One Caterpillar D9 tractor with Ate-



co ripper and six D8's were on the job handling the dozing chores.

In May 1955, the John Delphia Co., San Francisco, received a parallel $400,000 contract to add 450,000 yards to the project. This contract also was completed in October of that year.

By October, more than 4 million yards of fill had been dumped into the bay to form the foundation for the new freeway. In November, Atkinson received the final fill and grading contract, calling for 1.3 million additional yards of fill. It also called for the construction of two dequalization culverts in the embankment. These 10 by 16-ft. concrete ducts extend 300 feet through the new roadway base and will allow the water level inside the newly created lagoon to equalize itself with the water in the main body of the bay as the tide rises and falls.

This final $2.2 million contract also will provide a 615-ft. overpass over the Southern Pacific Railroad's tracks at the Sierra Point southern terminus of the overwater highway. It includes also an overpass off-ramp and the preparation of a new roadbed for the railroad. The Raymond Concrete Pile Co., San Francisco, sub-contracted the pile-driving work and had two pile-drivers on the job installing steel piles ranging from 40 feet upwards. Atkinson crews have laid a 72-in. concrete runoff drain and numerous other smaller drains and drainage structures.

When Atkinson is finished with the current work, only surfacing of the six-lane highway will remain. The Division of Highways expects to let the contract for that job shortly and to have it completed for a tape cutting ceremony next year. The surfacing will cost around $1 million, state engineers have estimated.

(Above) This dragshovel handles excavation of footings. (Below) A Joy drill cuts into the Franciscan sandstone, a uniform and mixed borrow material of rock and earth.

The Southern Pacific tracks, which have been relocated numerous times, are the only rail approach to San Francisco. The line formerly used a tunnel through the Sierra Point hill, but Atkinson shovels have eliminated the whole body of the hill, and the tunnel itself will be abandoned when the new roadbed is ready.

Some 850,000 yards were hauled and scraped away at Sierra Point, virtually eliminating a large point of land that projected into the bay. In its place will be the new track-bed, rail overpass, off-ramp and southern link of the overwater highway to the land freeway.

When the ribbon is cut, thousands of motorists will breathe a sigh of relief and arrive at home each day a bit less harried by the drive. They will be among the luckiest commuters in the country, able to drive the 30 or 40 miles to the heart of San Francisco on a non-stop, non-toll, first class super highway.

California will have spent some $7.5 million on the 3.7 miles of overwater highway, built on a bar of 5.2 million yards of earth and rock.

The overall project is under the direction of District IV of the Division of Highways which is part of the California State Department of Public Works. B. W. Booker, assistant state highway engineer for the district, is in charge. H. A. Hart is resident engineer.

An 18-ton steel bridge girder is set in position by an American crawler crane.

27-second loading.

deliver EXTRA "PAY-DIRT"

Note how extra-high Payscraper apron-lift provides obstruction-free room for fast unloading. And straight-line, power-saving ejector reeving leaves more power on Payscraper wheels, to speed dumping and spreading.

Air-assisted clutch; big, safe, 4-wheel air brakes; exclusive Hydro-Steer — all contribute to give the Payscraper its outstanding operating ease and safety. The two Payscrapers and two other towed scrapers are push-loaded by the TD-24.

Left to right: John L. Jersey; J. M. Harris, Supt.; Dale Jersey, Supt.; and William Donaca, General Supt. of the job.

. . plus super-fast get-away . .

on industrial district job

for John L. Jersey, Inc., Portland, Oregon

John L. Jersey, Inc., Portland, Oregon, uses International "55" Payscraper loading and transport speed—and famous TD-24 *follow-through* push-loading—to highball the 833,000-cu-yd Rockwood Industrial District contract to timely, profitable completion.

In only 27 stop-watch-certified seconds, and only 60 to 100 feet of travel, each "55" Payscraper's bowl boils heaping full of gravelly soil—and the "55" is off to the fill at up to 20 mph!

"More dirt on the fill"—more dough in the till

Owner John L. Jersey reports: "Last year we put over 2,000 hours on both our '55' Payscrapers with cable replacements as the only necessary repairs. This year we got two more '55's' and a new TD-24 to load them fast. I believe '55's' are the most scraper for the money.

"We've found our '55's' load in 25-30 seconds. They're simple and easy to maintain and operate. Quick, full-load Payscraper get-away means more dirt on the fill, and that's what we get paid for."

Largest of its kind in the Pacific Northwest, the triple-terraced, 188-acre Rockwood project, on the Columbia river, is a Union Pacific Railroad Co. development—to attract new industry to the Portland area.

Prove to yourself no other rubber-tired dirt-mover gives you the new Payscraper combination of capacity-adding performance features! See your International Construction Equipment Distributor for a demonstration!

See you at the ROAD SHOW—CHICAGO—Jan. 27 to Feb. 4, 1957

INTERNATIONAL HARVESTER

INTERNATIONAL®
Construction Equipment

International Harvester Company, 180 N. Michigan Avenue, Chicago 1, Illinois

A COMPLETE POWER PACKAGE INCLUDING: Crawler, Wheel, and Pipe-Boom Tractors . . . Self-Propelled Scrapers and Bottom-Dumps . . . Crawler and Rubber-Tired Loaders . . . Off-Highway Trucks . . . Diesel and Carbureted Engines . . . Motor Trucks

Indiana's Toll Road was opened officially by Gov. George N. Craig. His daughter, Margery, is shown cutting the ribbon.

News from the Field

Indiana Dedicates Road

The Northern Indiana Toll Road was dedicated September 17 in ceremonies at South Bend. State and national notables attended. The ribbon was cut by Margery Craig, 7, daughter of Gov. and Mrs. George N. Craig. All but a 16-mile section of the 156-mile Toll Road, from Gary to the Illinois line, is open.

Bridge Company Honored

A sustaining membership in the Society of American Military Engineers has been awarded to the San Francisco Bridge Co., San Francisco, Calif., as a token of appreciation for its contribution to the science of military engineering. The company has done much dredging work for the improvement of rivers and harbors in northern California.

AGC Foresees Increase

Under prevailing peacetime conditions, the nation's construction volume of all types may rise from the present annual rate of $60 billion a year to nearly $78 billion a year by 1965. That's what the Associated General Contractors of America concluded from a study it made. A report of the study was given at the midyear meeting of the AGC governing and advisory boards in Milwaukee, Wis., Sept. 17-19.

By the end of the next 10 years, the AGC estimated, increases of nearly one-third over current production of structural steel and portland cement supplies will be required for construction.

The study was made by a special committee on material supply appointed by Frank J. Rooney, Miami, Fla., AGC president. Charles B. Solomon, Boston, Mass., headed the committee.

Total construction activity, estimated this year to approach $44.5 billion in new construction and $15.5 billion in maintenance and repair, is expected to reach $77.6 billion by 1965—constituted of $58.3 billion in new construction and $19.3 billion in maintenance and repair operations. The estimates were made in terms of 1955-'56 dollars.

Nonresidential building, consisting of industrial, commercial, institutional, school and other types, both private and public, is expected to rise from its present $12.8 billion annually to more than $17 billion by 1965.

Highway construction is expected to rise by more than 50% to a level of around $8 billion a year by 1960 where it will remain for several years.

Public utilities, mostly private, including railroad, transit, petroleum and gas, electric light and power, and telephone and telegraph propects, are due to increase to $6.4 billion in 1965.

Conservation activity such as flood control, dam, irrigation and dredging projects may reverse its decline of several years and increase substantially to over $1.5 billion a year by 1965.

The construction of sewerage and water projects is expected to almost double in rate to $2.6 billion a year by 1965.

The only major category for which the AGC listed a decline was military construction, for which it indicated a gradual drop over the next 10 years to only 40% of the current annual volume.

The special committee reported that a pre-steel strike survey among the AGC members and chapters indicated that demand for both cement and structural steel equalled or exceeded available supply. The report stated that "the known requirements for the immediate future exceed the supplies that can be made available, and have resulted in

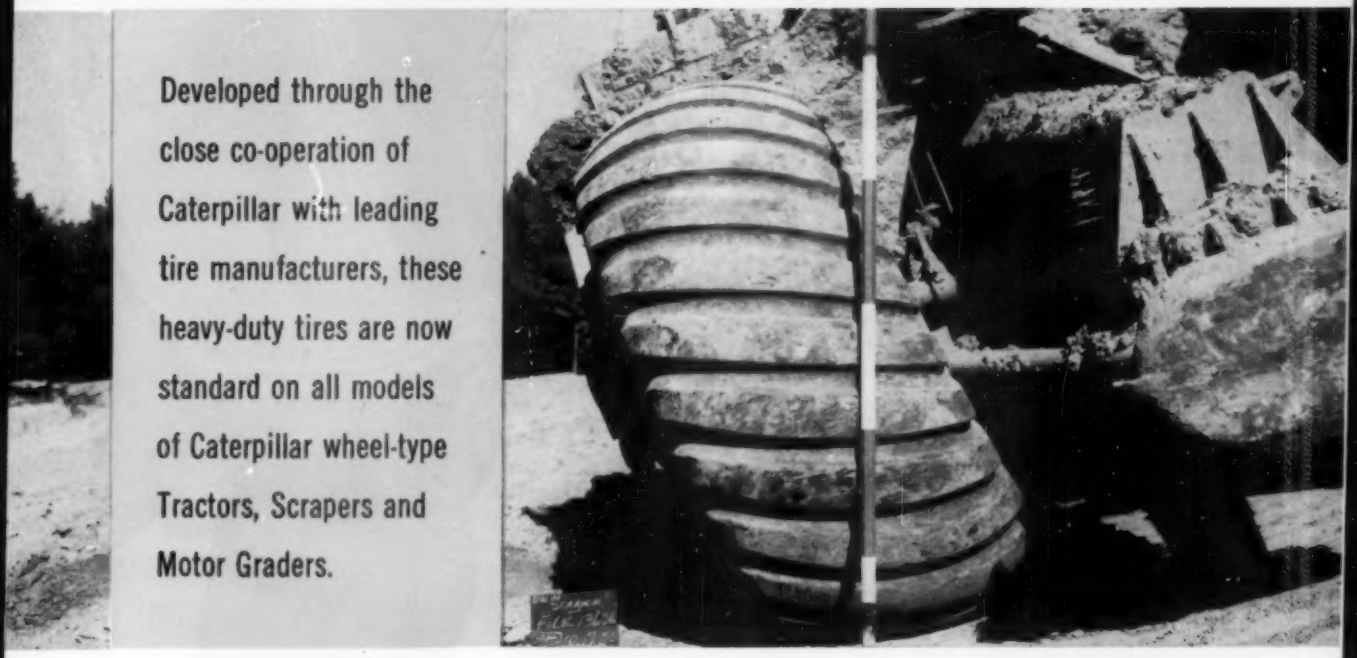
Continued on page 45

GIVE

Through YOUR
UNITED COMMUNITY CAMPAIGN

Caterpillar "torture tests" prove advantages of earthmover tubeless tires

Developed through the close co-operation of Caterpillar with leading tire manufacturers, these heavy-duty tires are now standard on all models of Caterpillar wheel-type Tractors, Scrapers and Motor Graders.



Punishing tests of heavy loads and high speeds at the Caterpillar Proving Grounds on Cat DW21 Tractors and Scrapers prove that new tubeless tires set new endurance records for earthmoving—pay off in longer life and less down time. Large photo at top shows test of bead air sealing ability with heavy, sidehill loads.

The search for a better way never stops at Caterpillar. The result—a constant flow of improvements in earthmoving equipment that pays off in increased production and lower costs on your job.

These new tubeless tires are an example of Caterpillar's policy of leadership in action.

From the start, Caterpillar spearheaded the design of these tires. Exhaustive "torture tests," made at the Caterpillar proving grounds on CAT* DW21 Scrapers, proved that they were miles ahead of tires then in use. Under heavy loads and at high speeds, tubeless tires outlived tube type by 63%.

Now in use in the field for almost a year, tubeless tires are delivering the superior performance indicated by the tests. They eliminate an estimated 80% of down time caused by tubed tires. They are quicker and easier to mount. And they also give better puncture and blow-out protection.

Tubeless tires are now standard on Caterpillar wheel-type Tractors (drive wheels), Scrapers and Motor Graders. As a result, you can count on even greater production at lower cost with less down time from these heavy-duty machines. For complete information, see your Caterpillar Dealer!

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

MODERN
HEAVY-DUTY
EARTHMOVING EQUIPMENT

This rope can take it!

MONARCH WHYTE STRAND WIRE ROPE BY MACWHYTE

Wherever you put wire rope to work, you need rope designed and made to earn its way on your toughest requirements, under severest service conditions.

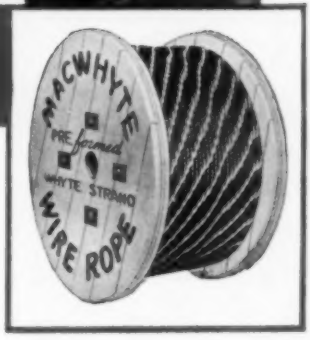
To provide you with exactly the *right* rope for each requirement, MONARCH WHYTE STRAND is made in every wire rope classification, PREformed and Internally Lubricated, Lang Lay or Regular Lay, with Fiber Core or Independent Wire Rope Core.

Put MONARCH WHYTE STRAND to the test on your equipment, you will be more than pleased with its performance.

Prices, literature, and catalog available through any Macwhyte distributor; or write direct. Ask for Special recommendations Booklet 5325.

See you at the ROAD SHOW CHICAGO Jan. 28-Feb. 2, 1957

MACWHYTE WIRE ROPE



Macwhyte Company, 2903 Fourteenth Avenue, Kenosha, Wisconsin

Ask for MONARCH WHYTE STRAND Bulletin 5425

Manufacturers of: Internally Lubricated PREformed Wire Rope, Braided Wire Rope Slings, Aircraft Cables and Assemblies, Monel Metal, Stainless Steel Wire Rope, and Wire Rope Assemblies.

MILL DEPOTS:

New York 4, 35 Water St.
Pittsburgh 19, 704 Second Ave.
Chicago 6, 228 So. Des Plaines St.
Detroit 3, 75 Oakman Blvd.
St. Paul 14, 2356 Hampden Ave.
Ft. Worth 1, P.O. Box 605
Portland 9, 1603 N.W. 14th Ave.
Seattle 4, 87 Holgate St.
San Francisco 7, 188 King St.
Los Angeles 21, 2035 Sacramento

Distributors conveniently located throughout the United States

1095C

News . . .

Continued from page 42

delivery schedules extending through 12 to 18 months in the future." A survey made after the steel strike was settled indicated that construction would feel its effects for many months.

The AGC study indicated that 10,398,000 tons of structural steel would be needed to meet the 1965 construction demand, an increase of 33% over the estimated supply for 1956. For portland cement a 32% increase in needs was estimated by 1965, from 343,660,000 barrels to 453,749,000 barrels.

Jersey Opens Extension

The Bayonne-Jersey City section of the $120 million Newark Bay-Hudson County extension of the New Jersey Turnpike was opened in September.

The 8.2-mile extension connects with the Turnpike at the Newark Airport interchange. The extension provides direct connection between the Turnpike and the Holland Tunnel.

The extension is a six-lane highway —three lanes in each direction separated by a barrier-type median. It will be lighted for the entire distance. The extension is 68% structure, including the long Newark Bay Bridge.

Says Jetting Compaction Unsatisfactory

An article in the September (1956) issue of *Excavating Engineer* (page 40) described how a California contractor compacted fill material with water under high pressure. The article, titled *Ditch Fill Compacted by 'Jetting'*, reported that two men could process 400 to 500 feet of trench per day jetting water under 80 psi pressure through 1-in. pipes.

Reader R. L. Greenman, assistant testing and research engineer for the Michigan State Highway Dept., writes that he has found the jetting process not always satisfactory.

"The Michigan State Highway Department has used the jetting process for many years in some phases of highway construction," he wrote. "However, it has been found that densities which are required to prevent ultimate settlement cannot be obtained by this method. This has been found particularly true in narrow trenches.

"The Michigan State Highway Department requires trench backfill to be compacted to 95% of the maximum density as determined by standard methods. Many studies have been made on the process of jetting the backfill into the trenches, and, in no case, has this method ever met the requirements for the specified density.

"We bring this matter to your attention as we anticipate considerable agitation from readers of your magazine desiring to compact by the jetting method on some of our projects. We would, therefore, appreciate your acknowledgement of this letter in *Excavating Engineer* stating our position in the matter."

Lockwood Heads ASCE

Mason G. Lockwood, Houston (Tex.) consulting engineer, has been named president of the American Society of Civil Engineers for the next year.

Installation of Lockwood was made Oct. 17 at the Society's national convention in Pittsburgh, Pa. Lockwood is a senior partner in the firm of Lockwood, Andrews & Newman.

Elected vice presidents for two years were Francis S. Friel, Philadelphia, Pa., and Norman R. Moore, Vicksburg, Miss. Friel is president of Albright & Friel, Inc., consulting engineers. Moore is chief of the engineering division of the Mississippi River Commission. Both have been directors of the society.

Those named directors for three years were: Randle B. Alexander, Austin, Tex., bridge engineer, Bridge Div., State Highway Dept.; E. Leland Durkee, Bethlehem, Pa., engineer of erection, fabricated steel construction, Bethlehem Steel Co.; Clinton D. Hanover, Jr., New York City, consulting engineer, Hardesty & Hanover; William J. Hedley, St. Louis, Mo., assistant chief engineer, Wabash Railroad Co.; Finley B. Laverty, Pasadena, Calif., chief hydraulic engineer, Los Angeles County Flood Control District; and Howard F. Peckworth, Chicago, managing director, Concrete Pipe Assn.

Finn Assigned to Test

Fred N. Finn, district engineer at Sacramento, Calif., for the Asphalt Institute, has been assigned as special project engineer on the forthcoming $14 million American Association of State Highway Officials (AASHO) test road project in Illinois.

Edmund W. Griffith

Edmund (Ed) W. Griffith, manager of the Westbury plant of the H. O. Penn Machinery Co., Inc., construction machinery distributors for the Long Island territory, died September 1. He was 57.

Mr. Griffith joined H. O. Penn in 1952. Before that, he had been associated with the Lone Star Cement Co. for 23 years, serving as sales representative in Nassau and Suffolk counties and later as metropolitan division sales manager.

Mr. Griffith was born and educated in New York. He had been active in politics in recent years. He was Nassau County Republican committeeman. He was a past president of the Long Island Salesman's Assn. and a member of the Long Island Assn., the New York Building Congress and the Circus Saints and Sinners. He was a Mason.

Mr. Griffith is survived by his wife, Leonore Griffith; two sons, Edmund W., Jr., and Lee B. Griffith; and a sister, Mrs. Marion G. Ashcraft.

Burial was at Lutheran Cemetery, Middle Village, L. I.

STANDS UP TO SEVERE USE

and even abuse

One word describes a Hayward — *ruggedness.* Yes, it's as tough, strong, sturdy as a bucket can be — and even more so. Extreme simplicity, little if any upkeep, high operating efficiency! Details on request. Write! THE HAYWARD COMPANY, 50 Church St., New York 7, N.Y.

HAYWARD BUCKETS

CLAM SHELL • ELECTRIC • ORANGE PEEL • GRAPPLES

famous for performance since 1888

From New Orleans to Ketchikan "Small" CAT* Diesel Tractors Lick "Big" Jobs

Caterpillar D4 and D2 Tractors, for their size and weight, are as rugged machines as ever wore yellow paint. There are hundreds of jobs they can do just as efficiently as their bigger brothers. And contractors are proving it.

The four tractors shown here are working in localities as far apart as Alaska and Louisiana, and none of them is on an easy job. One owner, John Hannigan, of Philadelphia, puts it this way: "They're tough. I'd never buy anything else. They'll outwork other makes any time and any where. The only repairs I've made on this D4 in three years were adjustments to the main clutch, tracks and steering brakes."

Both the D2 and the D4 are built to handle the tough jobs, right up to their capacity, all day long and month after month. Yet they're small and compact enough to work in cramped quarters—tunnels or narrow city streets. Both are economical to operate, and maintenance costs are consistently low, because they're *quality* built to stand up under punishment. Their dependable Caterpillar Engines have flywheel capacities of 48 HP for the D2 and 63 HP for the D4.

Let your Caterpillar Dealer show you how one of these smaller Cat Diesel Tractors will fit into your construction work and save you money. He backs their long work life with reliable service and Caterpillar parts you can trust.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

NAME THE DATE... YOUR DEALER WILL DEMONSTRATE

NEW ORLEANS

Taking the "blues" out of Basin Street, this Cat D2 Tractor, owned by Boh Brothers Construction Co., New Orleans, La., is helping widen the famous thoroughfare to 44 ft. on each side of a center parkway. Old St. Louis Cemetery shown in background.

TORONTO

Poce Construction Co., of Toronto, Ont., owns this D4 with No. 4A Bulldozer, shown 'dozing fill into a bend of the Humber River. This is a diversion job, digging a new channel to prevent flooding, and moving the earth into the old river bed.

KETCHIKAN

The D2 helped Manson-Osberg Co. in the construction of a 7 ft. x 8 ft. hydroelectric tunnel through granite rock near Ketchikan, Alaska. Equipped with scrubbers, the tractor worked the whole length of the 4000-ft. tunnel, moving out over 1000 cu. yd. of rock.

PHILADELPHIA

Here the D4, owned by Contractor John Hannigan, rips up old concrete foundations and rough grades for a new driveway and parking area at one of the Penn Fruit Co. supermarkets, in Philadelphia, Pa.

Equipment You Ought to Know About

Two Hough Payloaders

Manufacturer: The Frank G. Hough Co., 708 Seventh Ave., Libertyville, Ill.

Claims: Two new four-wheel-drive, pneumatic-tired "Payloader" tractor shovels have been introduced by Hough. They are the Model HH with a payload capacity of 1¾ yards (1⅓ yards struck) and the Model HU with a payload capacity of 1⅓ yards (1 yard struck).

New features incorporated in the design of both of the new units include the new Hough-designed and manufactured "Paylomatic" power-shift transmission. The necessity of coming to a stop for a "range-shift" is completely eliminated with the new transmission. All shifts in both forward and reverse can be made without slowing down.

The finger-tip directional control can be operated under full engine speed in any gear. The torque converter gives infinite speed ratios for maximum performance. Both transmission and torque-converter use standard SAE-10 HD oil.

The power-transfer differentials provide the best possible traction under all conditions by automatically transferring additional torque to the wheel with the best footing. Heavy-duty planetary final drives in the wheel hubs and hypoid differential gearing keep low torque in the axle and prolong life of all drive train parts.

Exclusive "Payloader" features include boom-arm design, which permits "pry-out" of the load, and the bucket action, which provides 40° tip-back of the load at ground level.

The load is cushioned during travel cycles by means of a hydraulic system load-shock-absorber.

The battery and oil reservoir on the new "Payloader" models are located under easy-access cover behind the driver's seat. The engine is readily accessible from either side unhindered by boom, cylinders or other structures. The hydraulic system is closed and pressure-controlled to keep air and dirt out.

Aveling-Barford Grader

Manufacturer: Aveling-Barford, Ltd., Grantham, England.

Claims: Aveling-Barford has introduced an 80 bhp motor grader, a four-wheel machine weighing nine tons without extras. Features include all-wheel drive, all-wheel steering, full hydraulic control, precision sideshift and high-

lift blade. Optional extra fittings include manual steering for high-speed road travel and a mechanical blade sideshift as an alternative to the standard hydraulic sideshift. The grader is powered by a Leyland diesel engine developing 80 bhp at 1,800 rpm. It has six forward and two reverse speeds. The standard circle allows the 12-ft. blade to rotate through 140°, but a full rotation hydraulic motor can be supplied as an alternative. Seven blade pitch posi-

40% FASTER THAN ANY OTHER DRILL

McCarthy Vertical Auger Drill Model 106-24

● The McCarthy Vertical Auger Drill cuts drilling time in earth, clay, compacted sand and gravel, hard pan, shale, sandstone and rock as much as 40%. Rugged construction permits you to drive 2 to 24-inch augers to depths of as much as 125' faster than any other drill. Get the facts on the powerful McCarthy today. See how you can complete shot hole, exploration drilling, foundation holes, dewatering operations, well drilling, highway construction and heavy contract work faster than ever before. The versatile, vertical McCarthy gives you more than any other drill. Write for Bulletin M-100 now. Let us show you how you can turn new profits on your drilling job.

MANUFACTURED BY
THE SALEM TOOL CO.
799 S. ELLSWORTH AVE., SALEM, OHIO, U.S.A.

tions are provided. A comprehensive range of extra attachments is available, including 11-tine scarifier, 9-ft. bulldozer and open or fully-enclosed cab.

Marion ¾-yd. Shovel

Manufacturer: Marion Power Shovel Co., Marion, Ohio.

Claims: Marion is producing the 35-M, a new ¾-yd. shovel and 18-ton crawler crane. It will be offered both with crawler and truck mountings. The truck crane will be known as the 35-MR and is rated at 25 tons.

Features include: fast, easy convertibility of front-end equipment without any machinery changes; air controls;

self-cleaning, non-clogging crawlers which feature a drive sprocket design that sheds dirt; heavy design and construction; independent boom hoist for power up, power down control of the boom as standard equipment; and antifriction bearings on high speed rotating parts and hook rollers.

Optional features include torque converters, independent travel, high gantry for booms over 55 feet, power removable counterweight and optional crawler mountings.

Mobile Generating Set

Manufacturer: White Diesel Engine Div., White Motor Co., Springfield, Ohio.

Claims: White has developed a mobile generating set permanently housed in a tractor-trailer unit. One of its uses is as a source of portable power in construction and mining operations.

Twin generator units rated at 500 kw each already have been produced by White and were shipped to Caracas for use by the Venezuela Development Corp.

The units, available in 350 and 500 kw sizes, are built into Fruehauf trailers and are hauled by gasoline-powered White 3000 Series tilt-a-cab tractors;

Continued on page 51

EVERY LOAD A PAY LOAD

Not conversation, but FACTS: the KIESLER clam shell, using the *proven* principles of leverage and power—applied to both shells—has more "DIGGING-IN" ability than any other bucket made. Results are deeper penetration-on-every-trip regardless of the material being moved, and greater payloads.

Mighty 9ce Tong Principle

PROMPT SERVICE AVAILABLE

Factory service on Kiesler Buckets and as an accomodation on other makes, too. Whatever the problem, feel free to call on us.

GUARANTEE

Kiesler Buckets are guaranteed to outperform and do a bigger day's work than any other Bucket of equal weight, width and size, when properly reeved and operated.

JOS. F. KIESLER CO.

KIESLER Since 1892

944 W. HURON ST. • CHICAGO 22, ILL. • MONROE 6-7144

Long Life QUALITY brings repeat orders

Here's proof from R. A. Bowen of Macon, Georgia, after more than 17 years of satisfied Bucyrus-Erie ownership. This veteran contractor of 25 years in the business started his happy association with Bucyrus-Erie equipment back in 1939 when he purchased a 20-B shovel. He was so impressed by its performance that he bought another in 1940, added a 15-B in 1947 and a 22-B in 1950. His shovels have delivered dependable high output year after year on the wide range of earthmoving contracts for highway and railroad construction and strip mining in Georgia. Today, enthuses Mr. Bowen: "all four are still giving good service."

All over the country, Bucyrus-Eries have gained a reputation for outstanding long life performance. Their ability to stand up is the result of the manufacturer's close attention to quality in the factory, where research and design, testing and manufacturing aim for perfection in every detail. Bonus quality in long life construction, dependable output and low cost maintenance continue to satisfy hundreds of repeat buyers. Get the complete story today from your nearby Bucyrus-Erie distributor.

220E56C

BUCYRUS ERIE

South Milwaukee, Wisconsin

See You at the Road Show.
Chicago, January 28-February 2, 1957.

New Equipment . . .

Continued from page 49

White Mustang engines power the tractors, which have 145-in. wheelbases.

The heart of the system is a Model 40 Superior diesel engine which is fed fuel from a tank on the trailer's belly. One tank of fuel can drive the generators at capacity for 12 hours.

All essential parts are standard production items. The generator in the 500 kw units, for example, is a 3-phase, 60-cycle Ideal unit developing 2,400 volts current.

Spacious walkways around the engine allow easy inspection. Louvers on both

sides of the trailer assure adequate ventilation for the operator. Doors are on both sides of the trailer.

The units are completely self-sufficient once their diesel fuel tanks are filled. One man can operate each unit at a single electrical distribution control panel.

After a unit is hauled to a site requiring temporary power, the tractor is removed and the trailer is left standing on the front landing gears and two rear jacks.

Lines from the generator are hooked to the transformer on the power lines or at a substation.

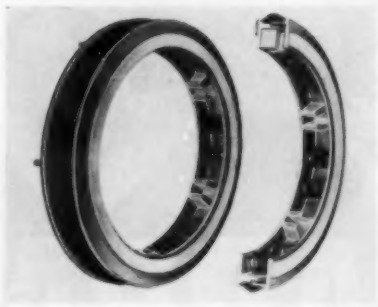
The Model 40 Superior engines, available in six or eight cylinders, recently were improved. Overall capacity was increased nearly 50% to 1,025 hp. The engine size remains the same.

The engines have open chamber combustion.

Final Drive Seal

Manufacturer: Sure-Seal Equipment Co., 1820 N. W. 25th Ave., Portland, Ore.

Claims: "Sure-Seal," a final drive bellows seal for Caterpillar tractors, is now being marketed. In addition to the regular rubber bellow, "Sure-Seal" has a neoprene "O" ring seal inside two metal



flanges. This extra seal prevents the lubricant in the final drive housing from reaching the rubber bellows.

"Sure Seals" are available for the final drive of Caterpillar D4, D6, D7, and D8 tractors.

Cat Electric Set, Pipelayer

Manufacturer: Caterpillar Tractor Co., Peoria, Ill.

Claims: A new 100 kw self-regulated diesel electric set has been added to the expanding line of Caterpillar-built power generating equipment. Known as the Cat D342 electric set, the new unit uses one of the new Caterpillar self-regulated generators to make available the principal advantages of previous self-regulated and externally-regulated generators in one package.

In order to assure maximum efficiency, the new generator has been designed and built specifically to match the Cat D342 diesel engine. It features extremely close voltage regulation and, in most cases, is capable of filling the needs of applications now served by externally-regulated units. Voltage drop and terminal voltage can be adjusted on the new generator to meet the needs of special installations. After adjustment, the controls are locked and no further adjustments are required.

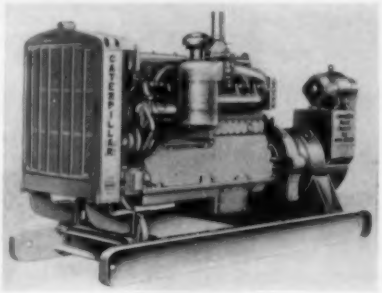
The new electric set's compact size and ease of connection help to simplify installation. No elaborate switchboards or external controls are required. It is easily paralleled with other generators.

Sufficient electrical capacity has been built into the new generator to give it the ability to handle the surge of heavy loads without affecting existing loads. Life of the generator is expected to match that of the D342 engine which powers it.

Caterpillar also has announced that new oil-type steering clutches and brakes and a number of other new features are being included in all No. 583 pipelayers now in production.

The new clutches and brakes are similar in design and construction to those recently announced for the D8 tractor. The life expectancies of these new clutches and brakes are expected to be similar to those of the Caterpillar oil-type master clutches which have been in service for several years.

The new clutches and brakes operate in oil baths, with oil circulating through grooves in the clutch facings and brake linings to remove heat before it can cause damage. Wear is also reduced by the film of oil that separates facings and their mating surfaces until the last revolution or two before engagement, keeping friction and heating to a minimum.



Because all of the components operate in an oil bath, there is no need for hand lubrication. A replaceable, gravity-type filter with a paper filter element is used in each clutch compartment to remove any abrasive material.

Other features now being included in the standard No. 583 pipelayer include new hydraulic brake boosters, hydraulic track adjusters, a new improved drawbar and 30-in. hard grouser track shoes.

New production models of the No. 583 will be designated as the Caterpillar No. 583 (Series E) pipelayer. Field change-over kits will be offered in the near future for all No. 583 (Series C) pipelayers.

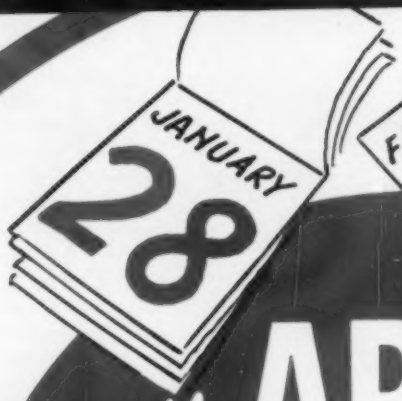
Chicago Pneumatic Tracdril

Manufacturer: Chicago Pneumatic Tool Co., 6 East 44th St., New York 17, N. Y.

Claims: Chicago Pneumatic is producing the G800 Tracdril, a self-propelled, one-man operated, track-mounted wagon drill. It gives a productive performance when mounting a heavy-duty 4-in. drifter. For speedy soft formation drilling, it can mount a CP-566 rotauger.

Two "power vane" reversible tramming motors enable the G-800 to tow its own air compressor around the drill-

Continued on page 56



WHO

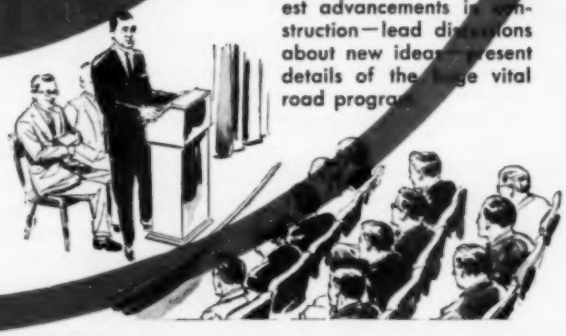
the ARBA ROAD SHOW and CONVENTION

Exhibits

Whatever your interests, you'll find the equipment, materials and supplies you use on display. New materials, new methods and current machines are exhibited.

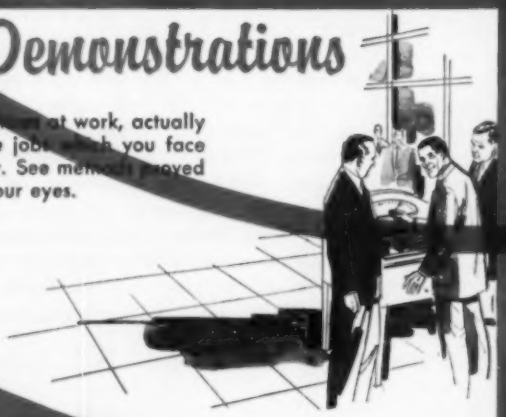
Discussions

Hear internationally-known authorities report on the latest advancements in construction—lead discussions about new ideas—present details of the huge vital road program.



Demonstrations

See machines at work, actually doing the jobs which you face each day. See methods proved before your eyes.



Get-togethers

The contacts you make will prove of inestimable value. Experts from every part of the world—every one ready to talk about your problems.

YOU'LL SEE THERE!

A partial list of exhibitors planning to be there

ACME IRON WORKS
AEROIL PRODUCTS COMPANY, INC.
AEROQUIP CORPORATION
ALLEN INDUSTRIAL PRODUCTS, INC.
ALLIS-CHALMERS MANUFACTURING CO.
AMERICAN BOSCH DIVISION
AMERICAN BOSCH ARMA CORPORATION
AMERICAN CHAIN & CABLE COMPANY, INC.
AMERICAN HOIST & DERRICK CO.
AMERICAN MANGANESE STEEL DIVISION OF AMERICAN BRAKE SHOE CO.
AMERICAN TRACTOR CORPORATION
AMERICAN TRACTOR EQUIPMENT CORPORATION
ARMCO DRAINAGE & METAL PRODUCTS, INC.
ATHEY PRODUCTS CORPORATION
AUSTIN-WESTERN COMPANY
BALDWIN-LIMA-HAMILTON CORPORATION
BARBER-GREENE COMPANY
BARCO MANUFACTURING CO.
BAY CITY SHOVELS, INC.
BLAW-KNOX CO.
WM. BROS. BOILER & MFG. CO.
BUCYRUS-ERIE COMPANY
BUDA DIVISION
ALLIS-CHALMERS MANUFACTURING CO.
THE BUFFALO-SPRINGFIELD ROLLER CO
L. BURMEISTER COMPANY
BUTLER BIN CO.
J. I. CASE COMPANY
CATERPILLAR TRACTOR CO.
CHAIN BELT COMPANY
C. H. & E. MANUFACTURING CO.
CHEVROLET MOTOR CORP.
TRUCK & COMMERICAL DEPARTMENT
CHICAGO RAWHIDE MANUFACTURING COMPANY
CHRYSLER CORPORATION—
DODGE DIVISION
C.I.T. CORPORATION
CLARK EQUIPMENT COMPANY
CLEAVER-BROOKS COMPANY
CLEMENT-BRASWELL, INC.
THE CLEVELAND GRAPHITE BRONZE COMPANY
CLEVELAND TRENCHER COMPANY
CONSTRUCTION MACHINERY COMPANY
CONTINENTAL MOTORS CORPORATION
COOK BROS. EQUIPMENT COMPANY
THE F. D. CUMMER & SON COMPANY
CUMMINS ENGINE COMPANY, INC.
D-A LUBRICANT COMPANY, INC.
DANA CORPORATION
RALPH B. CARTER COMPANY
THE EIMCO CORPORATION
ELECTRIC STEEL FOUNDRY COMPANY
ELECTRIC WHEEL COMPANY
ERIE-STRAYER COMPANY
E. D. ETNYRE & CO.
EUCLID DIVISION
GENERAL MOTORS CORPORATION
FISKE BROTHERS REFINING CO.
FORD MOTOR CO.
FRUEHAUF TRAILER COMPANY
FULLER MANUFACTURING CO.
THE GALION IRON WORKS & MFG. CO.
GAR WOOD INDUSTRIES, INCORPORATED
GENERAL ROAD MACHINES, INC.
GILSON BROTHERS COMPANY
GMC TRUCK & COACH DIVISION
GENERAL MOTORS CORPORATION
GOOD ROADS MACHINERY CORPORATION
DETROIT DIESEL ENGINE
DIVISION GENERAL MOTORS CORP.
DIAMOND IRON WORKS INC.
GOODMAN MANUFACTURING COMPANY
R. E. DIETZ COMPANY
DOTMAR INDUSTRIES, INC.
EAGLE IRON WORKS
EASTMAN MFG. COMPANY
THE FRANK G. HOUGH CO.
HUBER-WARCO COMPANY
HYATT BEARINGS DIVISION
GENERAL MOTORS CORPORATION
HYSTER COMPANY
INGERSOLL-RAND CO.
INTERNATIONAL HARVESTER CO.
IOWA MANUFACTURING CO.
JACKSON VIBRATORS, INC.
THE JAEGER MACHINE COMPANY
THE JEFFREY MFG. CO.
THE C. S. JOHNSON COMPANY
JOY MANUFACTURING CO.
KALAMAZOO DIVISION
THE NEW YORK AIR BRAKE COMPANY
KENSINGTON STEEL COMPANY
KOEHRING COMPANY
KOHLER COMPANY
THE GORMAN-RUPP CO.
W. E. GRACE MFG. CO.
THE HANSON CLUTCH & MACHINERY CO.
HARNISCHFEGER CORPORATION
THE HEIL CO.
THE HELTZEL STEEL FORM AND IRON CO.
HENDRIX MANUFACTURING CO., INCORPORATED
HERCULES GALION PRODUCTS, INC.
HERCULES MOTORS CORPORATION
HETHERINGTON & BERNER, INC.
HIGHWAY EQUIPMENT CO., INC.
HOMELITE DIVISION
TEXTRON AMERICAN, INC.
THE McCARTER IRON WORKS, INC.
McKIERNAN-TERRY CORPORATION
MINNEAPOLIS-MOLINE COMPANY
M-R-S MANUFACTURING COMPANY
MUNICIPAL SUPPLY COMPANY
MURPHY DIESEL COMPANY
NAPCO INDUSTRIES, INC.
N. P. NELSON IRON WORKS, INC.
NORDBERG MFG. CO.
NORTHWEST ENGINEERING COMPANY
THE OLIVER CORPORATION
LE ROI DIVISION
WESTINGHOUSE AIR BRAKE COMPANY
LESCHEN WIRE ROPE DIVISION
WATSON-STILLMAN COMPANY
R. G. LE TOURNEAU, INC.
LE TOURNEAU-WESTINGHOUSE COMPANY
LINK-BELT SPEEDER CORP.
LITTLEFORD BROS., INC.
THE LUFKIN RULE CO.
MACK TRUCKS, INC.
MACWHYTE COMPANY
MARION POWER SHOVEL COMPANY
MASTER VIBRATOR COMPANY
SMITH ENGINEERING WORKS
STANDARD STEEL CORPORATION
STANDARD STEEL WORKS
STOW MANUFACTURING COMPANY
THE SUPERIOR EQUIPMENT CO.
TAMPO MANUFACTURING CO.
THE TEXAS COMPANY
ASPHALT SALES DEPARTMENT
THE THEW SHOVEL CO.
THOR POWER TOOL COMPANY
THURMAN MACHINE COMPANY
TIMKEN-DETROIT AXLE DIVISION
ROCKWELL SPRING AND AXLE COMPANY
OSHKOSH MOTOR TRUCK, INC.
THE OWEN BUCKET COMPANY
THE PERFECTION STEEL BODY CO.
PETTIBONE MULLIKEN CORP.
PIONEER ENGINEERING WORKS, INC.
PORTLAND CEMENT ASSOCIATION
PUROLATOR PRODUCTS, INC.
RICE PUMP & MACHINE COMPANY
ROCKFORD CLUTCH DIVISION
BORG-WARNER CORP.
RODGERS HYDRAULIC, INC.
JOHN A. ROEBLING'S SONS COMPANY
ROSCO MANUFACTURING COMPANY
SCHIELD BANTAM COMPANY, INC.
SCHRAMM, INC.
SEAMAN-ANDWALL CORPORATION
SEAMAN ENGINEERING & RESEARCH CO
SHOVEL SUPPLY CO.
S K F INDUSTRIES, INC.
THE WHITE MOTOR COMPANY
WOOLDRIDGE MANUFACTURING DIVISION
CONTINENTAL COPPER & STEEL INDUSTRIES, INC.
THE TIMKEN ROLLER BEARING COMPANY
THE TORRINGTON COMPANY
TRACTOMOTIVE CORPORATION
TRANSPORT TRAILERS, INC.
TWIN DISC CLUTCH COMPANY
UNION CHAIN & MANUFACTURING COMPANY
THE UNION METAL MANUFACTURING CO.
UNION WIRE ROPE CORP.
UNIT CRANE & SHOVEL CORP.
UNITED STATES STEEL CORPORATION
VICKERS INCORPORATED
WALTER MOTOR TRUCK COMPANY
THE WARNER & SWASEY COMPANY
WAUKESHA MOTOR CO.
THE WEATHERHEAD COMPANY
THE WELLMAN ENGINEERING COMPANY
THE S. K. WELLMAN CO.
WHITE MANUFACTURING COMPANY
WISCONSIN MOTOR CORPORATION
WORTHINGTON CORPORATION

CHICAGO
International Amphitheatre

Jan. 28 – Feb. 2
1957

BUILD BETTER ROADS TODAY · FOR A GREATER AMERICA ·
AMERICAN ROAD BUILDERS' ASSN. 1902

NOT in the Contract

Daughter, returning from her honeymoon in tears, ran straight to Mama's house. "What has the brute done to my little girl," demanded Mama.

"I just found out," blubbered the bride, "that Herman is an atheist. He doesn't believe in Hell!"

"Don't worry, daughter," said Mama grimly. "Between the two of us, we'll convince him how wrong he is!"

The drunk dropped a dime in the slot of the parking meter and watched the needle go up to 60.

"Good gosh," he drooled. "I've gone and lost 100 pounds."

The saddest words of tongue or pen: "We sold the baby buggy, then. . . . "

Hilger was inordinately proud of his new girl. She, however, mistreated him at every turn, standing him up on dates, demanding her own way all the time, and frequently insulting him.

One day Hilger, after bragging about her to a friend, asked: "Tell me truly, Anderson, what do you think of my new girl friend?"

"Isn't she a little spoiled?" the friend suggested.

"No, that's only the perfume she likes to wear."

A couple of commuters were bragging about their children. One said, "When my son went to college, it only took him three years to get his B.S."

The second commuter scoffed. "That's nothing. When my daughter went to college it only took her two years to get a Ph.D."

The first commuter gasped. "That's impossible," he sputtered. "How could she get a Ph.D. in only two years?"

The proud father said complacently, "For her it was easy. She married him."

The drunk staggered into the candy store. "Do you sell candy with rum in the middle?" he asked.

"Sure," said the proprietor.

"Good," gurgled the drunk. "Gimme a quart of middles!"

Sam: "I was a 90-pound weakling, and when I took a date to the beach a 220-pound bully kicked sand in my face. So I took this course I read about and sure enough, in a little while I weighed 220 pounds."

Morris: "Then what?"

Sam: "So I went to the beach again with my date and a 440-pound bully kicked sand in my face."

A man telephoned the police to report that thieves had been at work on his car.

"They've stolen the steering wheel, the brake pedal, the accelerator, the clutch pedal and the dashboard," he complained.

A police sergeant said he would investigate. Then the phone rang again.

"Don't bother," said the same voice—this time with a hiccup. "I got into the back seat by mistake."

A fellow was pretty sick and the doctor ordered him to take a long vacation in Arizona. He went there and at the end of two months he died.

They brought the corpse back home and his wife and her brothers were viewing the remains.

She said: "Oh, Joe, doesn't he look nice."

And Joe replied: "He sure does. Those two months in Arizona certainly did him a lot of good."

A Frenchman boarded a plane in France for his first flight. An American asked him to take the seat next to him. As the Frenchman sat looking out of the window, he saw a little red truck drive away.

A few hours later they landed in New York. The Frenchman was still sitting looking out of the window. He saw the little red truck come up to the plane and as soon as he saw it leave, the plane took off. When they landed in Chicago the same thing happened.

Soon after they landed in Denver, the American turned to the Frenchman and said, "We sure are making good time, don't you think?" The Frenchman, still looking out of the window, replied, "Oh, yes, but so is that little red truck out there."

The jury had been deliberating all afternoon. At six o'clock, the judge ordered twelve dinners sent to the deadlocked group.

"Eleven dinners if you please, your honor," interrupted the foreman, "and one bale of hay."

"From this poetry, I'd say we were in the 'John.'"

THOSE SUBSTITUTE PARTS ARE SO NOISY! I HAVEN'T SLEPT A WINK ALL DAY!
DON'T WORRY, DEAR — THAT MACHINE'LL BE DOWN FOR REPAIRS IN NO TIME!
SCREECH!
SCREECH!

You can't tell the difference?

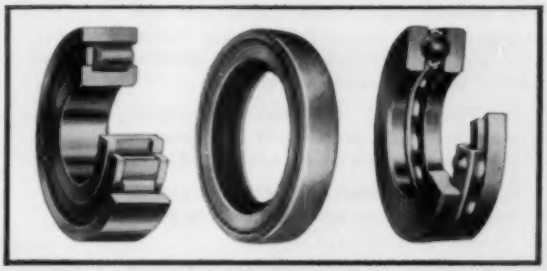
Take a substitute anti-friction bearing. Probably looks exactly like a Caterpillar part. But remember, there are many different bearings that fit a shaft and bore, yet only *one* may be right for maximum performance—the one designed especially for the machine—the one tested, specified and supplied by Caterpillar.

The same with seals. While seals may look alike, the material can vary in tensile strength, resiliency and hardness. CAT* lip-type seals meet *special* standards that assure the long-life reputation of Caterpillar machines. They are *matched* to the parts they protect. They're *right* for their particular job.

Why take chances with substitute parts? You're sure of finest quality *and maximum life* with Caterpillar parts!

Better see your Caterpillar Dealer's Salesman—and get Cat original parts every time.

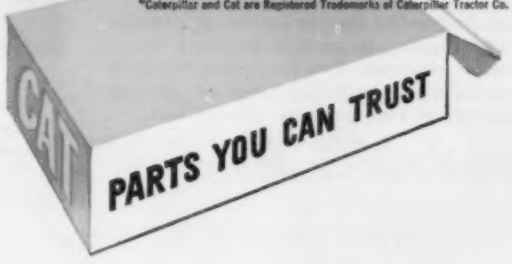
Caterpillar Tractor Co., Peoria, Illinois, U.S.A.



Each Cat anti-friction bearing and lip-type seal has been proved best for its particular application. Each one is assigned a Caterpillar part number—used only for that part in that application. Can you be sure with so-called "will-fits" and "look-alikes"?

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.



New Equipment . . .

Continued from page 51

ing area. Each track is independently powered by one of the two 6-hp motors. Spring loaded "dead man" type motor controls give instantaneous forward-back or pivot control.

During actual drilling operations, the G-800 is uncoupled from the compressor and, within hose limits, moves easily from hole to hole. Complicated hose hook-ups are eliminated because the air supply is always close to the operation.

Because the tramming motors are never used while the drifter or rotauger are in use, a 365-cfm rotary compressor will provide full operating efficiency. The G-800 will tow a 13,000 pound 900-cfm compressor up a 10% grade.

The Tracdril has a special "knee action" construction to compensate for ground irregularities. Tracks operate independently within the "knee action" limits and keep the U-arm support for the drill carriage relatively level. This U-arm is hydraulically elevated or lowered and employs dual safety locks to hold the setting. The drill carriage itself may be quickly adjusted for high top-hole or toe-hole drilling and compensated for ground irregularities. It also may be positioned either crosswise ahead of or between the track treads when running snake holes.

GM-Powered Michigans

Manufacturer: Clark Equipment Co., Construction Machinery Div., Pipestone Rd., Benton Harbor, Mich.

Claims: General Motors diesel engines are being offered as optional power plants on two models of Clark's Michigan tractor shovel line.

The Michigan 175A is now available with a Detroit Diesel Engine Div. Model 4-71 engine. Rated at 147 bhp at 2,200 rpm, the four-cylinder engine has a displacement of 283.7 cubic inches. Maximum torque is 366 lbs.-ft. at 1,600 rpm. Weight of the Model 175A with the new engine is 24,550 pounds.

Detroit Diesel's model 3-71 is offered in the Michigan 125A tractor shovel. The three-cylinder, 212.8 cu. in. engine is rated at 105 bhp at 2,200 rpm. Maximum torque is 275 lbs.-ft. at 1,500 rpm. The Model 125A weighs 19,340 pounds with the new diesel.

TerraTrac Backhoe

Manufacturer: American Tractor Corp., Churubusco (Ft. Wayne), Ind.

Claims: American Tractor announces a new TerraTrac backhoe designed and built exclusively for heavy-duty use on TerraTrac crawler tractors.

The TerraTrac boom is fabricated of heavy steel plate. It is said to have a lifting capacity of 3,000 pounds for handling pipe. The new unit digs 12½

Increase Dragline Efficiency with Bucyrus-Erie All-New Dragline Buckets

New concepts in design plus a special new lightweight alloy in Bucyrus-Erie dragline buckets offer you new efficiency in dragline operation. Look at these outstanding advantages:

Easy Loading — A "slicing-action" lip rapidly penetrates even tough materials, and a scientifically tapered basket permits full, heaped loads.

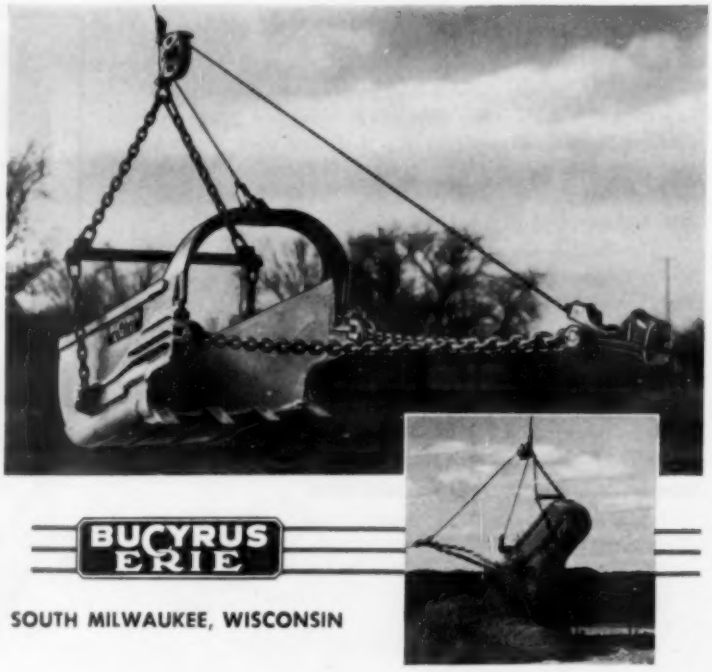
Less Bobbing, Spillage — Proper design incorporates correct flaring and balance of the bucket for clean carrying.

Fast Dumping—Smooth interior design and high arch permits quick, clean dumps.

Exclusive BECOLOY — A new special alloy developed by Bucyrus-Erie combines great strength with light weight, adds wearing ability and impact resistance.

New Bucyrus-Erie dragline buckets are available in three types: light, medium and heavy duty — solid or perforated. Your Bucyrus-Erie distributor has the experience to help select the right size and type for your operations. See him soon.

16R56C



BUCYRUS ERIE

SOUTH MILWAUKEE, WISCONSIN

feet deep, has a reach of 18 feet and a clear dumping height of 13 feet. The bucket rollback of 90° is controlled by an extra large hydraulic pump. Buckets from 17 to 24-in. wide are currently available. Other sizes and types of buckets will be furnished at a later date.

One of the features of the backhoe is a full 180° boom-swing with hydraulic foot-pedal control. The seat is upholstered.

Individually-controlled hydraulic outriggers, close-coupled to the tractor, anchor the tractor firmly.

The backhoe is being introduced on the TerraTrac Model "500" crawler tractor. The "500" is equipped with Borg-Warner torque converter drive and a choice of either 50-hp gasoline or 45-hp Continental diesel engine.

Cook Dump Trailer

Manufacturer: Cook Bros. Equipment Co., 3334 San Fernando Rd., Los Angeles 65, Calif.

Claims: Cook has introduced a new frameless, front-mount hoist, semi-dump trailer called the "Stabilift." It hauls a legal payload of 20 tons in most states.

The "Stabilift" eliminates the trailer frame. It uses lightweight rugged steel. Maximum stability is obtained with Cook's "tricycle" suspension and by the immobilization of the trailer springs during the final critical period of the dumping cycle.

A Cook feature is the "lifeguard channel construction" of the "Stabilift" body which adds to durability. The "Stabilift" is braced all around the dump body by a welded steel channel placed midway up the body side.

SAFETY'S ALWAYS IN SIGHT

Ever worried about your crew forgetting the rated capacity of a block? You're free from worry and they're free from danger with Crosby* "Load-Rated" Blocks because the load capacity is *embossed* in the side plates! A quick glance shows what the limits are—no chance to overload the block by mistake. Crews the world over are protected by genuine Crosby "Load-Rated" Blocks—are yours?

*REGISTERED TRADEMARK

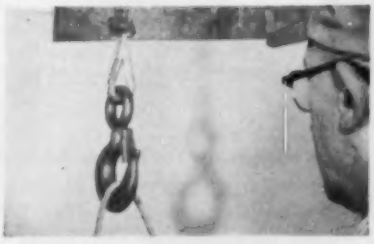
THE RIGHT COMBINATION

An exacting combination of design, steel and drop forging goes into Laughlin Shackles. A combination that results in maximum strength without brittleness that can result in fracture under shock load or in extreme cold! Pins used in Laughlin Shackles are forged from the same high quality steel—their extra hefty design makes them safer when shock loads accidently occur. When you see the famous Laughlin trade mark on shackles (and all other Laughlin fittings), you're seeing the mark of safety! Your nearby distributor has shackles in sizes from 3/16" to 3".

Double Clevis Link attaches 1/4" to 1/2" chain to rings, end and sling links, eye hooks, pad eyes, tractor eye bolts and other fittings.

The world's most complete line of fittings for chain and wire rope is described in the catalog available from your distributor.

LOADS STAY PUT!



Anyway you handle it—rough or easy—your load won't come off a Laughlin Safety Hook until *you* release it! The hook is drop forged and heat treated. The fool-proof latch mechanism is made of long life stainless steel or bronze—it'll never rust, never jam! See your Crosby-Laughlin distributor for information on sizes and capacities.

LAUGHLIN LINKS INSTALLED QUICKLY

Lower downtime—fast changeover is reported by companies using super safe Laughlin Double Clevis Links to couple standard and alloy chains to fittings. Users everywhere have cut out expensive, time-consuming welding and blacksmithing in favor of simple installation. Laughlin's heat treated

Stocked and sold by leading distributors everywhere

CROSBY-LAUGHLIN *Division*

American Hoist and Derrick Company

FORT WAYNE 1, INDIANA

More proof that CAT*

LOWBOWL

Scrapers deliver bigger, faster loads

Handling tough material on the Florida Turnpike, a new DW21 (Series C) Tractor-No. 470 LOWBOWL Scraper averaged 128 pay yd. an hour on a 6900-foot round trip

Recent tests on the Florida Turnpike confirm previous reports from other jobs in Iowa, Kansas and New Jersey—the new Caterpillar LOWBOWL Scraper steps up production with bigger, faster loads. Here's proof again that on the job, where results and only results pay off, the new LOWBOWL design delivers a new high in money-making performance.

Says Donald R. Grubbs, Superintendent for Troup Bros., Inc., Miami: "I like the wide-base tires on this new DW21—they help us over this sandy fill. The new LOWBOWL Scraper design also cuts down our loading time. What's more, we've had very little down time with our Caterpillar equipment."

Before you make your next bid, get the full facts about the new LOWBOWL Scrapers. Your Caterpillar Dealer's salesman carries completely documented details about their productive capacity on this and other jobs. Ask him to show them to you!

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

BIGGER, FASTER LOADS WITH CAT LOWBOWL SCRAPERS

RESULTS OF FLORIDA TURNPIKE JOB TEST

JOB AND LOCATION: Building 3.8 miles of new road on Florida Turnpike, near Hollywood. The job involves moving about 1,000,000 cu. yd. of sand. The contractor: Troup Bros., Inc., Miami. CONDITIONS: *Material*—very fine, loose white sand with an estimated shrinkage of 25% borrow to compacted. *Loading*—D9 (Series D) Tractor with torque converter used for pusher. *Haul distance*—3250 feet over loose to damp, compacted sand, maintained by a No. 12 Motor Grader. Rolling resistance, 100 lb./ton. *Return distance*—3650 feet. *Grades on haul*—400 feet of 1°-3° adverse and 600 feet of 1°-2.2° adverse.

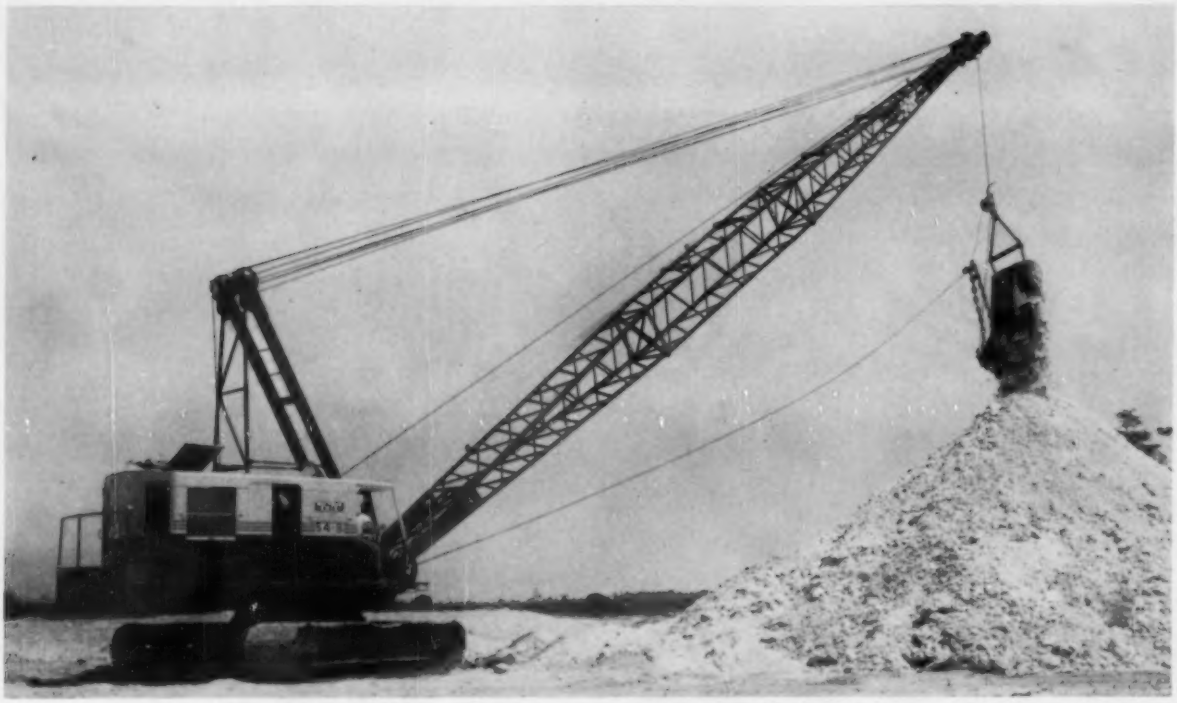
TIME STUDIES

AVERAGE	DW21-No. 470 LOWBOWL Scraper
Load time	.44 min.
Haul time	3.33 min.
Haul speed	11.14 MPH
Spread and turn time (180°)	.38 min.
Return time	3.37 min.
Return speed	12.31 MPH
Wait time	.39 min.
Total cycle time	7.91 min.
Trips per hour	7.59
Pay yd./trip	16.8
Production pay yd./hr.	128

REMARKS: The loose, fine sand was difficult material to load. In spite of this, average loading time was excellent, due to the fast-loading characteristics of the new No. 470 LOWBOWL Scraper. Average cycle time was excellent, too—a reflection of the new DW21's Turbocharged power and wide-base tires!

The new two-wheel Cat DW21-No. 470 LOWBOWL Scraper

A new four-wheel DW20-No. 456 LOWBOWL Scraper is also available. Both units have a capacity of 25 cu. yd. heaped and 18 cu. yd. struck. Both feature the new Turbocharged, 6-cylinder Caterpillar Engine which delivers 300 HP (maximum output) and 10% more rimpull. New LOWBOWL design loads more material with less resistance clear to the end of the loading cycle. And wide-base tubeless tires, now standard equipment, eliminate the major portion of down time caused by tires. All these and other new features add up to bigger, faster loads for you with Cat LOWBOWL Scrapers!



Meekins has opened a new pit on a 180-acre site at Pompano, Fla., where this 2½-yd. dragline is digging test holes.

Meekins . . .

Continued from page 33

will have been supplying the company with sand and rock for nearly 40 years.

Overburden on the pit was less than five feet.

"We'd hardly open a pit if the overburden was deeper than five feet." said Edwin Cline, Meekins' control engineer in charge of quality control. "A bulldozer usually takes off the overburden with the help of two 10-yd. International scrapers."

Meekins has two dozers—the TD-24 and a Cat D2.

A bright sun shone on the quarry the day of our visit, presenting a scene that resembled a blazing white desert. The man without sun glasses squinted.

Two Bucyrus-Erie 38-B's, both with 1½-yd. dragline buckets, are assigned to digging and stockpiling the material.

Loading operations are handled by two ¾-yd. machines—a Bucyrus-Erie 22-B and a Northwest 25—and a ½-yd. Koehring 205. They load the material into two Euclid TVD 10-ton rear dumps, which are driven past the water-filled pit for about a half mile to the crusher.

The Euclids dump the rock into the hopper, where the crushing process starts. Stackers carry the crushed material into four piles. A ¾-yd. clamshell —another 22-B the day we visited— works in the stockpiling area.

Michigan rubber-tired loaders drop the stockpiled material, as needed, into Meekins' fleet of 20 Mack dump trucks, most of them 10-wheelers, for delivery to retail customers or to the block and redi-mix plants.

Kindly Clifton Meekins keeps abreast of his business daily from a handsome office he maintains on the plant grounds. Clad in a sport shirt, slacks and a straw hat, he was comfortable against the heat when *Excavating Engineer's* representatives visited him.

Meekins has watched his business grow in an area where many concrete plants have been established.

Meekins is president of the firm. Thomas Kearns is vice president and Edward T. Foster is secretary-treasurer. Others who help make the business prosper are: Kenneth Turnbull, safety director; Charles Miller, manager of the Pompano plant; I. I. Miller, block plant superintendent; Harold White, garage superintendent; and George Brewer, truck foreman.

Turnbull reported that Meekins' drivers covered nearly a million highway miles without an accident in 1955.

Meekins has gone a long way to satisfy his customers in 34 years.

A tractor loader dumps ¾-in. stone into a Ford truck. The main plant and pit at Hollywood are located on the same site that Clifton Meekins first spaded in 1922.

strong

Roebling's finest!

Royal Blue's extra strength

vastly increases...even doubles...

wire rope service life

John A. Roebling's Sons Corporation, Trenton 2, N. J., Subsidiary of The Colorado Fuel and Iron Corporation BRANCHES: ATLANTA, 934 AVON AVE. • BOSTON, 51 SLEEPER ST. • CHICAGO, 5525 W. ROOSEVELT RD. • CINCINNATI, 8340 GLENDALE-MILFORD RD., EVENDALE • CLEVELAND, 13225 LAKEWOOD HEIGHTS BLVD. • DENVER, 4801 JACKSON ST. • DETROIT, 915 FISHER BLDG. • HOUSTON, 6216 NAVIGATION BLVD. • LOS ANGELES, 5340 E. HARBOR ST. • NEW YORK, 19 RECTOR ST. • ODESSA, TEXAS, 1920 E. 2ND ST. • PHILADELPHIA, 230 VINE ST. • PITTSBURGH, 1733 HENRY W. OLIVER BLDG. • SAN FRANCISCO, 1740 17TH ST. • SEATTLE, 900 1ST AVE. S. • TULSA, 321 N. CHEYENNE ST. • EXPORT SALES OFFICE, 19 RECTOR ST., NEW YORK 6.

Success goes to those methods to meet

Times change • Needs change

Big jobs ahead call for a review of your equipment inventory . . . a careful review of your earthmoving methods. Some of us old timers go back to the days of team-and-scraper, team - and - wagon, wheel - and - float steam-shovel on earthmoving, with the Fresno and split-log drag for leveling and maintenance.

Then the work dimensions changed and our equipment changed to meet them. Shovels shed their steel wheels, rolled on crawlers. Steam went out and gasoline came in. Trucks replaced wagons . . . tractors, new on the farm, shed wheels for tracks, and tried for a place on the roads.

Load-haul-spread tractor-drawn wheel scrapers took over most of the short-haul production earthmoving. Dynamite replaced black-powder, jack-hammers replaced sledge-hammers and hand-drills. Leaning wheels revolutionized the application range of the early graders.

As job dimensions changed earthmoving machines made further changes. Diesel engines replaced use of gasoline. Rubber-tired prime-movers hauled dirt faster and farther. Off-road rubber-tired haulers replaced most of the highway-type dump-trucks. More power and bigger capacity gave answers to larger projects, shorter hours, higher wage rates.

Now we can see more changes in our problems of today and tomorrow. Answers we found in the power and traction dimensions, together with bigger buckets and bodies, no longer can meet all the needs we face. We must work in the other dimensions

---

TOURNAPULL-SCRAPERS—138, 208, and 293 hp models heap 7.5, 18, and 25 cu. yds. fast . . . work and travel on or off-highway at speeds to 29.9 mph. Electric power-steer turns prime-mover 90° . . . rigs make 180° turns in area narrower than machine's length. Power-transfer differential applies traction to wheel on firmest footing.

TOURNATRACTORS —208 hp Model "C" with 24,700 lbs. pull at 1.5 mph . . . works and travels on or off roads, to 17 mph fwd., 7 mph rev. Giant 416 hp TWIN-C TRACTOR, with 65,900 lbs. drawbar pull, loads biggest scrapers easily . . . has power king-pin steer . . . travels at 20 mph, rev. to 5.8 mph. Both have torque converter.

Flexibility for added utility. TOURNAPULL prime-movers earn year-round profits with interchangeable trail-units: scraper, rear-dump, bottom-dump, side-dump, flat-bed hauler, lift-and-carry crane, and logging arch. Model "D" has added utility with bulldozer and V-type snow plow attachments. TOURNA-TRACTOR Model C may be equipped with bulldozer, Angle-dozer, push-block, root-rake, railroad car-coupling, winch, side-boom crane, tree stinger, and V-type snow plow and wing. Also pulls wheeled scraper, sheepsfoot-roller, Rooter, and other types drawbar equipment. ADAMS GRADERS available with Elegrader, scarifier, bulldozer, snow plow and wing, rotary snow plow, and snow-blo attachments.

who can anticipate and change today's and tomorrow's needs

of speed and mobility if we are to meet this new and growing challenge of more and more yards to move, longer hauls with greater variables in unit length and quantity, shorter time limits, short labor-supply at even higher wage-levels.

For over twenty years LeTourneau-Westinghouse has been working toward the only possible answers. This was to give you new types of equipment on rubber to increase your performance ability in these dimensions of speed and mobility.

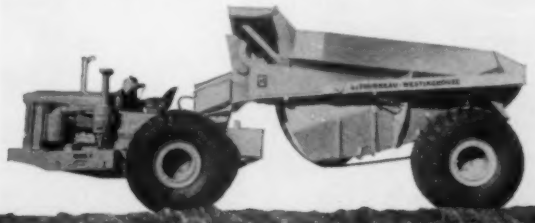
The problem of applying speed and mobility to heavy off-road dirtmoving equipment presented some very difficult engineering problems. Over their 20 years of field experience and improvement, we believe they have found and perfected some real answers to these problems and, today, can give you most for your money in dependable rubber-tired equipment performance applied to the four dimensions of 1. power, 2. traction, 3. speed, and 4. mobility.

As you equip for the tremendous growth in earthmoving ahead, be sure to study carefully the improved line of LeTourneau-Westinghouse self-propelled scrapers . . . rear-dumps . . . tractors . . . and graders. Every one of these machines is a better machine than we offered last year or in the years before. Every one of them offers big advantages in speed and mobility that will be more and more important to you in solving all the problems involved in the bigger and bigger earthmoving projects ahead of us.

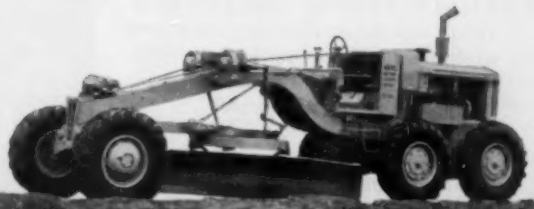
May we suggest that you call us today and ask us to help you check your present equipment inventory and recommend a planned program of replacement and additions to meet your needs for the future. Then take time to see these up-to-date LeTourneau-Westinghouse machines perform on your own job *or on jobs like yours.*

We would also like to suggest that you plan to order well ahead of required delivery. The best equipment for you is best for others, too, and, in spite of a tremendous increase in manufacturing facilities, LeTourneau-Westinghouse is having difficulty keeping up with demands from customers who have already proved the importance and value of greater speed and mobility on their own jobs.

REAR-DUMPS—11, 22, and 35-ton haulers powered by 138, 208, and 293 hp Tournapull prime-movers, haul on or off-highway to 34.4 mph. 90° turn-ability permits 180° turns loaded, in space narrower than machine's length . . . in ¾ of length with dump-body raised. These units dump clear over bank, pull out with front-wheel drive.



ADAMS GRADERS—Heavy-duty models, 20,900 to 27,730 lbs.; 80, 104, 123, 150 hp . . . have 8 fwd. speeds to 26 mph, 4 rev. to 13 mph, and 3 optional creeper speeds. Utility grader, 60 hp, 14,865 lbs., 18.3 mph; 5 fwd., 1 rev., 4 optional creeper speeds. TRAVELOADER, to 26 mph, loads 600 yds./hr.



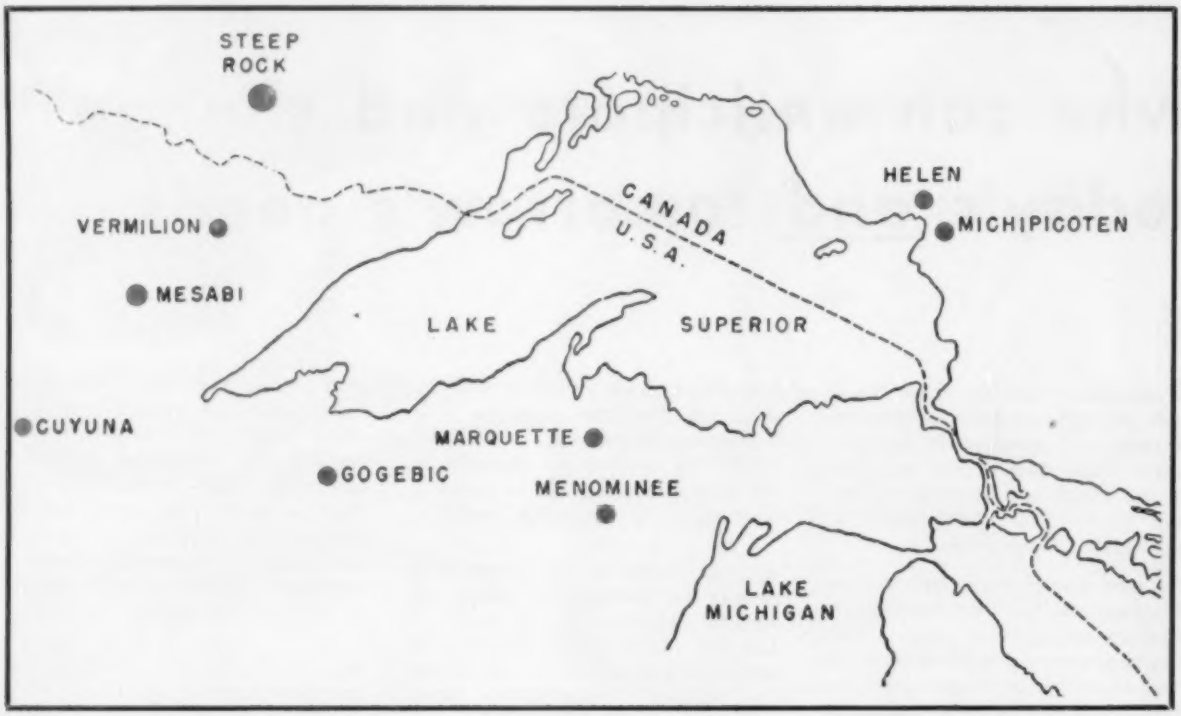
Adams, Rooter—Trademark, Tournapull, Tournatractor, Angledozer—Trademark Reg. U.S. Pat. Off. G-1102-H

LeTourneau-**WESTINGHOUSE** Company, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

ARBA

See you at the ROAD SHOW • Chicago • January 28-February 2, 1957



Map shows location of Steep Rock range in relation to iron ranges of the Lake Superior region. It has been producing since 1944.

Steep Rock . . .

Continued from page 31

three shifts a day, for an average total of 225 feet per shift of 8 hour duration.

Since the first 40-R rotary went into operation September 12, 1955, it has drilled a grand total of 78,634 feet for a lifetime average of 176 feet per shift. This figure includes drilling in limestone, greenstone and ore and includes work under all kinds of weather conditions. Maximum footage drilled during any 8-hour shift has been 580 feet. Bit life has averaged 1,248 feet and has gone as high as 4,220 feet.

75% Availability

The 40-R has had a high 75% availability record. Straight operating costs of drilling have been cut in half by introduction of rotary drilling, according to Superintendent Andrecheck.

"We think the 40-R has done a wonderful job for us," Andrecheck says. "Our purchase of a second unit is the best indication of that."

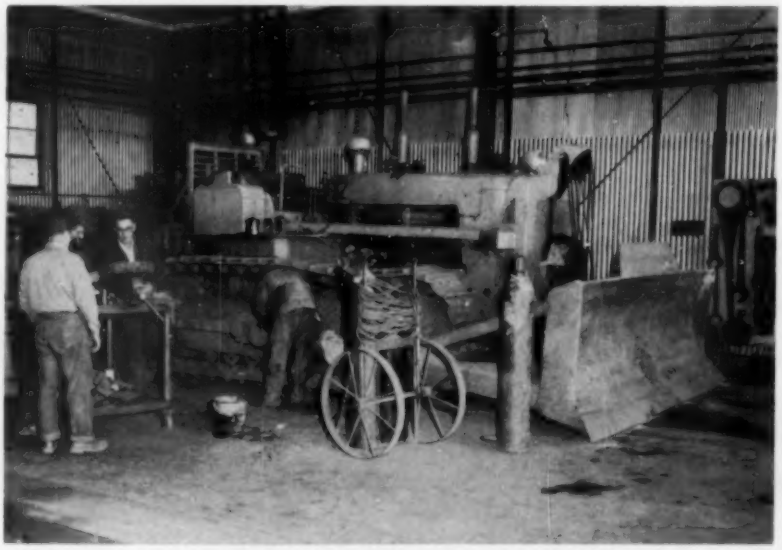
Steep Rock Mines has been experimenting with a Euclid twin-engined Model TS-18 scraper to move muck from a waste dump to the abandoned Errington open pit where waste material is being deposited. Truck and shovel methods of removal of this dump are costly. Two 34-ton trucks working under a 2½-yd. shovel load out an average of 120 yards per hour in the pit.

One 'Twin' Euc can move approximately 100 yards per hour over the same haul route—about a half-mile long—eliminating the labor of two men. The experiment worked out so well that Steep Rock Mines has purchased three additional units.

The four-wheel drive 24-yd. scraper is self-loading in the semi-loose rock-strewn material. It is powered by a pair of 218-hp diesel engines mounted front and rear. With full load, the unit can travel at speeds up to 26 mph.

Ore loaded out of the Hogarth mine is hauled by truck to an Allis-Chalmers crushing plant located at the bottom of

Continued on page 68



An International TD-24 dozer is serviced in the truck and tractor shop. The mining firm has an elaborate, regularly scheduled maintenance program for all equipment.

more yards per load . . . more loads per hour

DIG MORE Powerful pry-out action and 40° bucket tip-back at ground level get full bucket loads with less spillage loss. Power-transfer differentials provide sure-footed traction for digging power.

CARRY MORE Bucket carry position is close and low for maximum stability. Hydraulic system shock absorber cushions loaded bucket—smooths the ride—permits higher carrying speeds with less spillage.

DELIVER MORE Since you get MORE to begin with and keep MORE while traveling at higher speeds . . . with less spillage in both instances . . . the result—you deliver more yards per load and more loads per hour.

Now you have a choice of three sizes of 4-wheel-drive "PAYLOADER" tractor-shovels, each with *all* the more-productive features pioneered and proven by The Frank G. Hough Co.

They have power-transfer differentials—an exclusive "PAYLOADER" tractor-shovel feature that maintains effective traction on mud, gravel, ice and snow.

They have "no-stop" power-shift transmissions and torque converters . . . planetary final drives . . . power-steering and 4-wheel power brakes.

They have the exclusive bucket motion with 40° bucket tip-back at ground level and powerful pry-out action.

For proof of their superior performance and greater productive capacity on *your* job, ask your "PAYLOADER" distributor for a demonstration.

THE FRANK G. HOUGH CO. 3
708 Sunnyside Ave., Libertyville, Ill.

Send full data on 4-wheel-drive "PAYLOADER" tractor-shovels.

- ☐ model HO 2¼ yd. payload; 1¾ yd. struck
- ☐ model HH 1¾ yd. payload; 1½ yd. struck
- ☐ model HU 1½ yd. payload; 1 yd. struck

NAME _____

TITLE _____

COMPANY _____

STREET _____

CITY _____

STATE _____

PAYLOADER®
MANUFACTURED BY
THE FRANK G. HOUGH CO. LIBERTYVILLE, ILL.
SUBSIDIARY—INTERNATIONAL HARVESTER COMPANY

BONUS QUALITY

BONUS QUALITY is built into every Bucyrus-Erie excavator — Bonus Quality in design, in materials and in manufacturing. No matter what a job calls for — shovel, dragshovel, dragline, clamshell, or crane — Bucyrus-Erie Bonus Quality brings you extra dividends in low maintenance, outstanding performance, and extra years of service. See your Bucyrus-Erie distributor soon for complete details on machines from ⅜ to 4 cubic yards. 216E56C

QUALITY STEEL is assured at Bucyrus-Erie. A test bar is poured from each batch of steel and thoroughly analyzed to make sure it meets exact specifications.

BUCYRUS ERIE

BUILD BETTER ROADS TODAY · FOR A GREATER AMERICA · See you at the ROAD SHOW CHICAGO Jan. 28-Feb. 2, 1957

NEW MEXICO — A ⅜-yd. 10-B digs gravel for county roads near Miami. Owner reports, "Easily moved and fast. Can do as much as a larger machine".

LONG LIFE for wearing parts, like gears and pinions, is assured through manufacturing care like this — automatic flame hardening that controls hardness to just the right degree.

NORTH CAROLINA — Work on a new highway right-of-way near Kingston goes along smoothly with this ½-yd. 15-B dragline on the job. "I wouldn't trade it for anything", says the enthusiastic owner.

WISCONSIN — "Smooth and fast", reports the operator of this ¾-yd. 22-B shovel as he loads crushed rock for a county building project near Lancaster.

means BONUS PERFORMANCE on the job!

OHIO — "It sure stands the gaff", reports the owner of the 2-yd. 51-B shown here digging clay and quicksand on a new highway near Conesville.

WASHINGTON — Dependability is particularly desirable in places like wild Olympic National Park where this 1½-yd. 38-B is building a new access road.

BUCYRUS-ERIE COMPANY

South Milwaukee, Wisconsin

TEXAS — This 2½-yd. capacity 54-B swings a 3-yd. dragline bucket to load out pit run gravel for the supply of a commercial gravel plant.

PENNSYLVANIA — A 3-yd. 71-B spearheads construction on an extension of the Pennsylvania Turnpike near Bear Creek. Digging in almost solid rock, owner reports, "The 71-B is doing an outstanding job".

CALIFORNIA — When you're reaching high on a structural steel erection job like this new bridge near Pasadena, you need the smooth, accurate control that a Bucyrus-Erie 88-B can bring you.

Superintendent of the Hogarth open pit mine is Roy Andrecheck, who has been with Steep Rock since 1946. He is a 1939 graduate of Michigan Tech, Houghton, Mich.

Steep Rock . . .

Continued from page 64

the pit. Minus 8-in. ore passes through a grizzly screen and is carried directly onto conveyor belts. Plus 8-in. ore is sent through a 48 x 60-in. jaw crusher where it is reduced.

A 4,300-ft. long Hamilton conveyor lifts the ore on a 36-in. belt 500 feet to the loading terminal on Narrows Island at ground level. The loading plant equipment includes double-deck sizing screens and storage bins from which railroad cars are loaded.

The function of the screening process is to segregate premium lump grade from the ore as mined. Five grades of ore are being produced in 1956. These are the Hogarth, 58.79% iron; Seine River, 57.06%; Steep Rock lump, 61.04%; Rainy Lake, 55%; and Marmion, 57.33%.

The natural iron content of these ores is exceptionally high with very low silica and phosphorus content. The percentage of phosphorus is well below the limit for a Bessemer grade ore, making all five types valuable for mixing with non-Bessemer grades to reduce combined content of phosphorus.

About 2% of the Hogarth pit production is the Steep Rock lump grade containing 4 to 8-in. pieces. It is a premium grade ore which commands a high price at ports on the lower end of the Great Lakes. Because of its structure and high iron content, it has characteristics desirable for open hearth steelmaking.

The Seine River grade represents about 90% of the production. It consists of the finer material, each particle of which is less than 2-in. size, and little of which is finer than 100 mesh.

To service the Hogarth and Errington mines, the Canadian National Railway has a rolling stock of 600 75-ton ore cars and 600 50-ton cars. Ore trains travel the 144-mile distance between Atikokan and Port Arthur via the Canadian National line which is double-tracked in some areas and controlled by automatic block signals. A 60,000-ton capacity ore dock, capable of handling several ore boats simultaneously, has been constructed at the Lakehead port to handle Steep Rock's production.

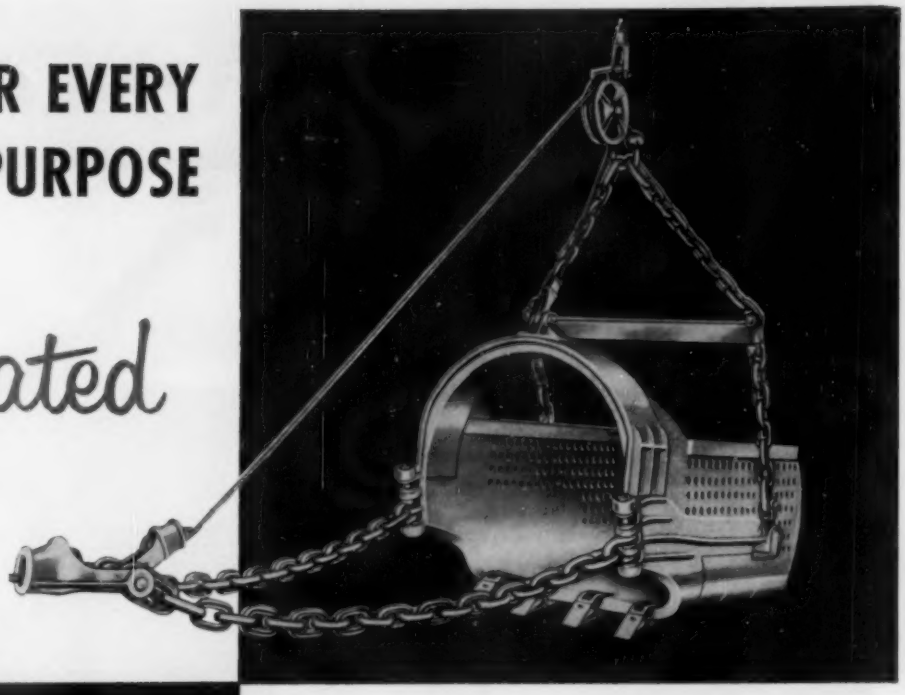
Up to 1953, Steep Rock's production came solely from the Errington open pit on the south end of the Middle Arm. By August 1953, stripping operations in the northern end of the Middle Arm had advanced far enough to permit large-scale production in the new Hogarth pit. The Hogarth now is the only productive pit because open-cut mining in the Errington pit is no longer economical due to its great depth and the long hauling distances required. The Errington was abandoned in fall of 1953, as

Continued on page 72

A long string of cars loaded with Seine River grade ore of minus 2-in. size heads for the 60,000-ton capacity ore dock at Port Arthur, Ont., where lake vessels are loaded.

A TYPE FOR EVERY DIGGING PURPOSE

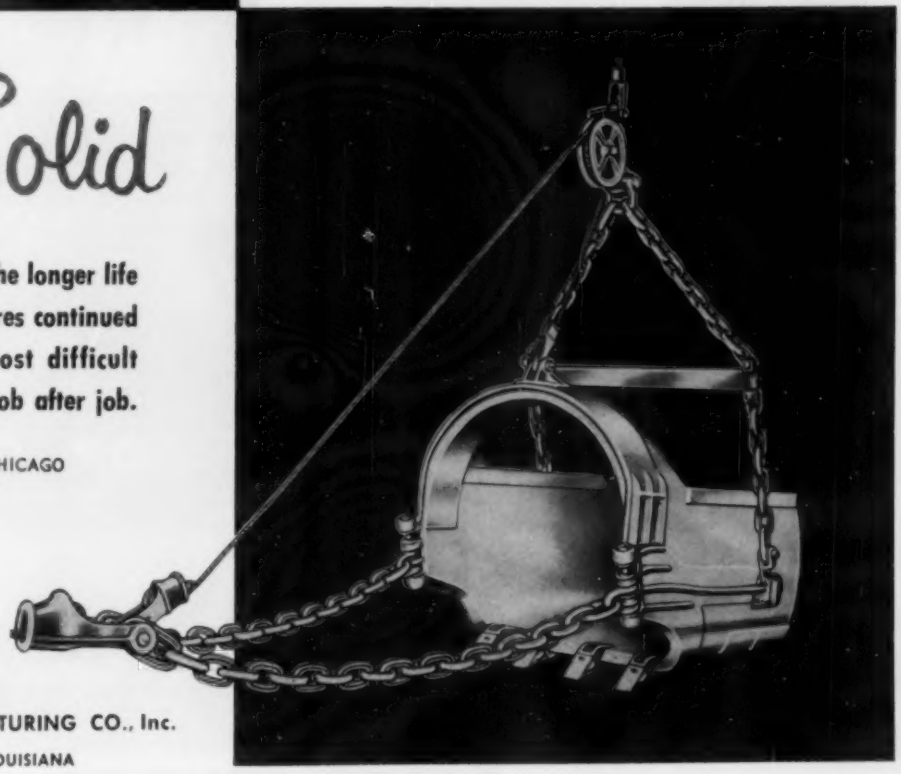
Perforated



HENDRIX
DRAGLINE BUCKETS

¼ to 40 Cubic Yards

Solid



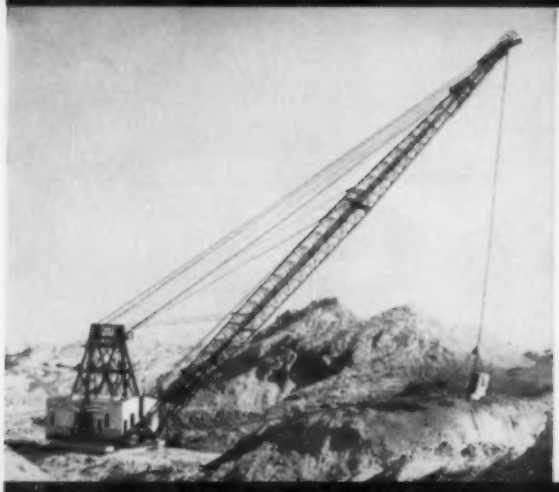
Perforated or Solid . . . . the longer life of a Hendrix Bucket assures continued PROFITS on even the most difficult digging operation . . . . job after job.

See you at the ROAD SHOW — CHICAGO
Jan. 28-Feb. 2, 1957

Hendrix Lightweight DRAGLINE BUCKETS

HENDRIX MANUFACTURING CO., Inc.
MANSFIELD, LOUISIANA

WHATEVER YOUR JOB



MARION 7400 Walking Dragline—10 to 13 yards

MARION 5760—60 yard Stripping Shovel

. . . THERE IS A MARION

MARION 43-M—1 yard Shovel—20 Ton Crane

MARION 35-M—25 Ton Truck Crane

. . . AND TYPE FOR GREATEST

MARION MEANS BUSINESS!

Write for further information on these and other machines in Marion's range of types and sizes from ⅓ to 75 cubic yards.

All crane capacities are actual usable ratings.

REQUIREMENT . . .

MARION 151-M—7 yard Shovel

MARION 362—1½ yard Shovel—30 Ton Crane

MACHINE OF THE RIGHT SIZE . . .

MARION 111-M—4 yard Shovel—105 Ton Crane

MARION 93-M—2½ yards—50 Ton Crane

EFFICIENCY!

MARION POWER SHOVEL COMPANY
MARION, OHIO

Working shaft of the underground Errington mine is located on Float Ore Island, where iron ore was first discovered years ago.

Steep Rock . . .

Continued from page 68

far as surface work is concerned, and is being filled with overburden stripped from the adjacent Hogarth.

Underground mining operations using block caving methods are now in progress in areas under and adjacent to the Errington pit.

The Steep Rock ores are deep-seated. For this reason, underground mining becomes advantageous as the site is developed. Subsurface developmental work was begun in 1950 when the B-1 shaft was built. This shaft located on Float Ore Island, a quarter of a mile south of the orebody, was sunk to a depth of 1,200 feet.

A Birdsboro-Buchanan 40 x 48-in. crusher was installed underground and a system of belt conveyors was set up to carry ore from the crusher to loading terminals on the surface.

When brought into full production, the underground mine will have a capacity of 1½ million tons per year.

As the open pits at Steep Rock become deeper and less economical to operate, more shafts will be sunk and eventually the entire Steep Rock iron range will be mined from the subsurface.

Operations of Steep Rock Iron Mines, Ltd., are under the direction of M. S. Fotheringham, president and general manager. K. L. McRorie is superintendent of underground mining and Ray Andrecheck is superintendent of the Hogarth open pit mine. John Kerwin is pit superintendent. He is assisted by Tom Heale, general pit foreman, with Vic Turpin, Ed Newman and Swen Knutsen as shift foremen.

The Steep Rock organizational setup also includes Walter Bannister, general engineer; Gordon Edwards, mechanical equipment supervisor; Jim Arthur, electrical equipment supervisor; and Bill Gilmore, Hogarth mine engineer.

New Trade Literature

Subject: **AGC Equipment Expense Manual**

Content: A general revision of the foreword to the *Contractor's Equipment Ownership Expense* manual has been completed by the Associated General Contractors of America. Prepared as a guide for construction contractors, the manual is a compilation of average costs of owning and maintaining construction equipment; it is not a schedule of rental rates. Changes made in the new revision include: 1, headings reduced from 220 to 88 and listings cut back from 2,422 to 810 to eliminate duplication; 2, addition of an alphabetical index with cross-reference listings; 3, additions of new items of equipment. Copies of the revised manual are $1 each.

Where to get: The Associated General Contractors of America, Inc., 1227 Munsey Building, Washington 4, D. C.

Subject: **Ford Tractors**

Content: *Ford Industrial Tractor Power*, a new magazine which will be published four times a year, is being sent free to contractors, landscapers, public utilities, coal yards and other users of industrial equipment. The magazine describes and illustrates uses of Ford tractors. Hints on servicing Ford equipment also are included.

Where to get: Tractor and Implement Div., Ford Motor Co., Birmingham, Mich.

Subject: **Air Hose Fittings**

Content: Air hose fittings for mining, tunneling, quarrying and contracting work are listed in an 8-page illustrated bulletin issued by the LE-HI Div., Hose Accessories Co. The line includes steel, malleable iron and bronze air hose couplings, hose clamps, hose nipples, valves and manifolds. Ask for bulletin 110.

Where to get: LE-HI Div., Hose Accessories Co., Philadelphia 32, Pa.

Subject: **International Trucks**

Content: Complete information on International Harvester's four-wheel

Continued on page 74

Steep Rock Lake . . .

another example of how Bucyrus-Erie rotaries cut blast hole drilling costs

At Steep Rock Lake, 140 miles west of Port Arthur in Ontario's Rainy River district, Steep Rock Mines Ltd. recently replaced three cable tool drills with one Bucyrus-Erie 40-R rotary blast hole drill. Working in the dewatered Hogarth open pit section of the lake's basin, the electric-powered 40-R drills 7⅞-in. holes in high grade direct-shipping ore with an average iron content of 60%.

The cable tool drills were delivering 50 feet of 9-in. hole per 8-hr. shift. Average hole depth was 28 feet. Cost records for early stages of 40-R operation show that the machine has cut drilling costs per foot of hole (average hole depth is the same) by more than 50%.

This is just one of many case histories which are proving the drilling superiority of Bucyrus-Erie rotaries daily. Behind performance like this are these outstanding features: rotary drive with Ward Leonard control of rotating speed; hydraulically powered pulldown force; remote-controlled power-driven tool handling unit; and air-blast cleaning of drill holes.

For complete information on the 40-R, write today. Also ask about the larger 50-R machine for drilling 9⅞ to 12¼-in. holes.

35B56C-e

BUCYRUS-ERIE COMPANY

SOUTH MILWAUKEE, WISCONSIN

RENT INTERLOCKING STEEL SHEET PILING
'FASTER from FOSTER'
ALL LENGTHS & ALL SECTIONS TO MEET ALL YOUR JOB NEEDS
Foster's lower rental rates on all standard piling sections give you a low fixed expense as an added competitive advantage when bidding on jobs. RENT: Light-weight Corrugated Steel Sheet Piling—Pile Hammers and Extractors.
Send for: Piling Chart EE-11.
L B FOSTER co
PITTSBURGH 30 • NEW YORK 7 • CHICAGO 4
HOUSTON 2 • LOS ANGELES 5 • ATLANTA 8

New Literature . . .

Continued from page 72

conventional and cab-over-engine heavy-duty trucks with six-cylinder engines is contained in a new 20-page catalog. Gasoline, liquefied petroleum gas and diesel-powered models are reviewed. Design and operating features of the four-wheel R-line and CO models, manufactured as straight trucks and truck tractors, are presented. Ask for No. CR-674-F.

Where to get: Consumer Relations Dept., International Harvester Co., 180 N. Michigan Ave., Chicago 1, Ill.

Subject: **Welding Procedures.**

Content: A new 140-page pocket data book featuring simplified welding procedures for base metals is now available from Eutectic Welding Alloys. The data book is intended as a guide to improve torch and metallic arc welding, brazing and soldering. Useful "how-to-weld" information is given for fabrication, maintenance repair and salvage, overlaying for wear and corrosion resistance and welding of dirty, rusted parts. Special welding applications such as joints with high electrical conductivity, resistance to chemicals, tinning and plating are covered. Data is also given on methods of gouging, chamfering and removing of unwanted metal without special equipment. Weld preparation steps are given for all metals. The welding procedures presented stress ways to save dismantling, pre-and-post heating. Procedures given also tell how to get maximum machinability, how to get color matching deposits, how to increase weld strengths and cut down on both amount of alloy used and finishing time and work. Descriptions of more than 60 Eutectic low temperature welding alloys are provided as an alloy selection guide. Ask for booklet TIS 2575.

Where to get: Eutectic Welding Alloys Corp., Technical Service Dept., 40-40 172nd St., Flushing 58, N. Y.

Subject: **J & L Wire Rope Manual**

Content: A revised edition of Jones & Laughlin's manual on wire rope is now available. The 96-page manual contains extensive information on the selection, installation, and best operating practices for wire rope. Included in the revision is new material on the applications of JalKlamps and JalFlex slings.

Where to get: Wire Rope Div., Jones & Laughlin Steel Corp., Muncy, Pa.

Subject: **V-Belt Drives**

Content: Two easy-to-read self-mailers are offered by Worthington to help users of V-belt drives diagnose many of the common causes of trouble in their drives. They are *V-belt Savers #2 and #3*, part of a series of five. Cartoon-type drawings illustrate each trouble-saving tip. The mailers are sized just right to tack up on wall near drive, or on machinery itself for reference. Mailer #2 points out how to select proper drives; install drives and belts; keep sheaves in tip-top shape; adjust belts; check motor and drive shaft for alignment. It presents four useful tips to save trouble in setting up new installation. Mailer #3 illustrates symptoms of V-belt failure and gives diagnosis and cures for all kinds of V-belt troubles. Also available with Mailers #2 and #3 is Mailer #1 previously offered by Worthington. Mailer #1 tells how to keep V-belt drives delivering maximum rpm.

Where to get: Advertising & Sales Promotion Dept., Worthington Corp., Harrison, N. J.

PUT ALL YOUR PROFITS IN ONE BUCKET!
OMAHA DRAGLINE BUCKET
Omaha Dragline Buckets get out and dig in for you...meaning bigger profits with every load. Alloy steel cutting teeth are tough and sharp. It's faster, smoother working. Nearly 50 years of "know-how" assures quality that lasts in the field. You can't buy a better bucket!
Write today for catalog of complete information and specifications for four types available.
DRAKE-WILLIAMS MOUNT • OMAHA, NEBR.

BIGGER CAPACITY, PEAK PRODUCTION and HIGHER PROFITS

go hand in hand!

M-R-S 250 — 500 H.P. and Wooldridge—M-R-S 34 c. y. struck scraper. The world's largest rubber tired scraper combination. 88% greater struck capacity than the largest standard competitive units!

Regardless of the size of your jobs, you can *up production – increase profits* with BIGGER CAPACITY M-R-S equipment!

For every size job — for every size operation, M-R-S offers bigger capacity for greater production and higher profits than ever before. M-R-S equipment helps increase your profit these very important ways:

1. **Lower investment** per yard of struck capacity! Fewer M-R-S units required to do the job!
2. **Bigger capacity** for more pay yards — extra profit every cycle!
3. **Lower labor, operating cost and overhead** to charge to each yard of dirt moved.
4. **Faster hauling speeds** for more cycles per hour!
5. **M-R-S extra profitable versatility** to power all standard drawbar equipment.
6. **Greater equipment availability.** More profitable working hours.

Whether you are using 12 c.y. units or 18 c.y. units, you can profit from M-R-S BIGGER CAPACITY. ***Get the BIGGER CAPACITY — BIGGER PROFITS facts today!***

Investigate before you invest!

M-R-S 200 — 335 H.P. and Wooldridge—M-R-S 30 c. y. struck scraper. 66% greater struck capacity than the largest standard competitive units. Hauls BONUS PROFIT payloads every cycle.

M-R-S 190 — 288 H.P. and Wooldridge—M-R-S 26 c. y. struck scraper. 44% greater capacity to outproduce even the largest standard competitive units at lower equipment investment per yard of struck capacity.

M-R-S 150 — 250 H.P. and Wooldridge—M-R-S 20 c. y. struck scraper. Provides up to 66% greater payloads for contractors presently using low capacity 12 to 15 c.y. struck equipment, without proportionate increases in investment cost per yard of struck capacity.

ARBA

See you at the ROAD SHOW CHICAGO Jan. 28-Feb. 2, 1957

THE EMBLEM OF DEPENDABILITY

M-R-S MANUFACTURING COMPANY

Flora, Mississippi, U.S.A.

TO ADVERTISE: All advertising in this section is payable in advance. Rate: $1.00 per line, or $12.00 per inch of 12 lines. Minimum charge $4.00. No discounts; no commissions. Please count your copy carefully to avoid delay. Each line contains 41 characters (34 characters if all capital letters are used). Count spaces and punctuation as one character each. Allow 10 characters for box number, if blind advertisement is desired. Be sure to enclose the correct amount of money with your order. Closing date—15th of preceding month. Example: January closes December 15th.

TO INQUIRE: Be sure to address your inquiry to the advertiser by using the correct box number. Mail your letter in care of Excavating Engineer, South Milwaukee, Wisconsin. Write each advertiser a separate letter. Do not write us for name and address of advertiser. This information will not be given out. We have no information about the equipment advertised other than that shown in the advertisements themselves.

LARGE SHOVELS, CRANES, DRAGLINES — 3 YDS. & UP

SHOVELS—DRAGLINES
DRILLS
CRANES—EUCLIDS

9-W Bucyrus-Erie Drag, 165', 10 yd.
625 Page Diesel Drag, 150', 10 yd.
625 Page Diesel Drag, 160', 9 yd.
6160 Bucyrus-Monighan Elec. Drag, 160', 8 yd.
621 Page Diesel Drag, 135', 5 yd.
621 Page Diesel Drag, 125', 7 yd.
7200 Marion Drag, 120', 7 yd.
200-W Bucyrus-Monighan Drag, 140', 6 yd.
2400 Lima Drag, 120', 6 yd.
4500 Manitowoc Drag, 120', 5 yd.
620 Page Diesel Drag, 115', 6 yd.
120-B Bucyrus-Erie Elec. Drag, 115', 5 yd.
111-M Marion Drag, 80', 5 yd.
1055 P&H Drag, 110', 4 yd.
1201 Lima Drag, 85', 3 yd.
3500 Manitowoc Drag, 80', 2½ yd.
1001 Lima Drag, 80', 2½ yd.
955 P&H Drag, 100', 2½ yd.
54-B Bucyrus-Erie Drag, 85', 2½ yd.
80-D Northwest Drag, 65', 2½ yd.
170-B Bucyrus-Erie Elec. 6½ yd. Shovel
1600 P&H Elec. 6 yd. Shovel
1500 P&H Elec. 5 yd. Shovel
120-B Bucyrus-Erie Elec. 4½ yd. Shovel
111-M Marion 4 yd. Elec. Shovel
111-M Marion 4 yd. Diesel Shovel
1055 P&H 3½ yd. Shovel
1201 Lima 3½ yd. Standard Shovel
111-M Marion 3 yd. High Lift Shovel
1201 Lima 2½ yd. High Lift Shovel
3500 Manitowoc 3 yd. High Lift Shovel
80-D Northwest 2½ yd. Shovel
54-B Bucyrus-Erie 2½ yd. Shovel
38-B Bucyrus-Erie 1½ yd. Shovel
25 Northwest ¾ yd. Shovel
22-B Bucyrus-Erie ¾ yd. Shovel
Unit 1020 ¾ yd. Shovel
802 Lima Cranes
600 Reich Heavy Truck Mounted Rotary Air Drills (Both Lever Arm and High Mast)
58-BH Joy Champion Rotary Air Drills
Also 42-T, 29-T and 27-T Well Drills

FRANK SWABB EQUIPMENT CO., INC.

313 Hazleton Nat'l Bank Bldg.

Hazleton, Pa. GLadstone 5-3658

Page 625 diesel dragline, S/N 242, new in 1951, has 150' boom and 9 yd. Page bucket; machine in A-1 condition; available now; located near Pittsburgh, Pa. Price $225,000. Box 3697

LARGE SHOVELS, CRANES, DRAGLINES — 3 YDS. & UP

Model 175 Bucyrus-Erie electric dragline, rail mounted, 125' boom, 5 yd. bucket.
Model 360 Marion electric dragline, rail mounted, 156' boom, 8½ yd. bucket.
Central Florida location—priced as is or loaded for rail shipment.

R. H. CLARK EQUIPMENT CO.
P. O. Box 2566 Mulberry, Florida
Phone 2541 or 2881

Lima 2400 dragline equipped with 110' boom, two 7-yard Hendrix HS buckets, one 6-yard ESCO bucket, Kohler light plant; machine powered with Caterpillar D-397 diesel engine; 63" wide treads; long caterpillar frames; machine shipped September 1950; completely overhauled June 1955; engine completely overhauled April 1955; Approximately $5000 in spare parts available; Price, as is where is, $115,000. Box 3677

Bucyrus-Monighan Model 6160 Diesel Dragline 160' boom, several buckets 8 to 10 cubic yd. sizes. Base 36' diameter, engine Fairbanks-Morse diesel, separate Caterpillar engine for swing generator, approximately $50,000 worth of new and used parts.

One all-steel bulkheaded spud barge, 175' x 49', 6" x 11' deep, 3 drum hoist, ample fuel and water storage capacity, will clear all Mississippi River locks and meets U. S. Coast Guard requirements.

Will sell dragline alone or in combination with barge. Will not sell barge alone unless dragline has been sold.

For further details or inspection please reply to: Box 3704

Page 620 dragline, S/N 165, new in 1943; has 120' boom and 5 yd. bucket; machine in good working condition, but idle since November 1955; located near Pittsburgh, Pa. Price $50,000. Box 3698

Bucyrus-Erie 200-W diesel dragline shipped in 1950; 125 ft. boom, 6 yd. heavy duty and 7 yd. light weight buckets; some spare parts included; good mechanical condition. Location Melbourne, Australia. Box 3682

SMALL SHOVELS, CRANES, DRAGLINES — UP TO 2½ YDS.

2—Model 27-T Bucyrus-Erie blast hole drills, crawler mounted, chain and sprocket drive, equipped with telescopic derrick and built-in tool wrenches; powered by Int'l. gasoline motors, water cooled, 4-cylinders with twin disc clutch; with the following accessory equipment for 6⅝" drilling: combination and regular drill stems, wire rope sockets, drill bits and fishing tools; also one spare jack shaft completely installed, will fit either unit.
1—#8 Bucyrus-Erie bit dresser; complete without motor.
1—Coke furnace; with Champion electric blower.

All items are located at:

W. E. GRAHAM & SONS QUARRY
P. O. Box #4207 N. Sta.
Winston-Salem, N. C.

SMALL SHOVELS, CRANES, DRAGLINES — UP to 2½ YDS.

Northwest 2¾-yd. shovel with 24" treads and G.M. 3-71 diesel engine. New 1949. Price f.o.b. Fletcher, N. C. $7,500
Bucyrus-Erie 10-B crane, gas engine, serial #14448. As is. Price f.o.b. Greensboro, N. C. $1,500
Allis-Chalmers TS-300 motor scraper with Buda diesel engine $8,500
Allis-Chalmers TS-200 motor scraper with A-C diesel engine $17,500

E. F. CRAVEN COMPANY
Greensboro, N. C.

MANITOWOC MODEL 3500 STRIPPING SHOVEL, S/N 3602; equipped with 45' boom, 34' sticks and 2 cubic yd. dipper; powered with Caterpillar D-17000 diesel engine new in 1951; machine is in good operating condition. Price $35,000 as is, where is, and can be inspected at Sunnyhill Coal mine near New Lexington, Ohio. Box 3692

Bucyrus-Erie 22-B, Caterpillar D318 engine; machine used only part time; absolutely perfect throughout; must see to appreciate; ¾ yd. rock bucket; excellent undercarriage; financing available. Call or write Midland Machinery Co., Chillicothe, Mo. Phone 280.

MISCELLANEOUS EQUIPMENT

Johnson concrete batching, mixing plant.
Erie concrete batching plant.
Bulk cement plant, 600 bbls., w/ batcher.
Placer dredges, 4½', 12', 16' (2 abroad).
Bucyrus walker dragls., 9, 6, 5, 200W.
Colby hammerhead crane, 300', 15-ton.
Shovels, cranes, dragls., 1½ to 18 yds.
Locomotives, diesel, gas, 15 to 80 tons.
S/L derricks, steel, 75, 35 and 20 tons.
Rotary kilns, dryers; 9x140, 6'x60', etc.
Diesel-elec. generators, 500 to 1000 KW.

H. Y. SMITH COMPANY
828 N. Broadway Milwaukee 2, Wis.

New 18" dredging pump, rectangular cross section casing, high alloy steel liners, high alloy cast steel 4 van runner; spare liners. Box 3696

One shovel attachment, complete, including drum lagging and dipper trip for 15-B Bucyrus-Erie machine; used very little; first class condition. F.O.B. Little Rock, Arkansas $1,250

LYONS MACHINERY CO.
904 Broadway Little Rock, Arkansas

POSITIONS WANTED

Superintendent available; 30 yrs. experience and qualifications covering all types of sewers, water lines, highways, airports, heavy and light excavating, earth fill dams; know cost, plans and specifications, materials, labor and modern equipment; honest, sober and reliable; best of health and a pusher; available for any part of the U.S.A. Box 3702

EIMCO 105 -- MORE POWER FOR MORE WORK

Eimco 105 Tractor-Excavators are balanced to give maximum work efficiency in every phase of digging and loading. Compare these figures—(A) 39,200 pounds of digging force at the bucket lip as the 105 moves into the rock pile; (B) 39,200 pounds of lifting capacity for breakout power.

This power gives the operator the same potential in productive capacity as he would have if you bought him a boom type shovel costing three to four times as much.

How does Eimco design a small (1½ yard) Tractor-Excavator to outproduce every other machine in its price range?

The answer to this is Eimco's unique Tractor design which provides better balance, lower center of gravity and delivers full engine horsepower to the bucket at all times.

Eimco also makes it easier to operate the 105 Tractor-Excavator. The operator sits up front where he can see what he is doing. Two small handles, easily held in one hand, control all movements of the Tractor. The operator does more work with less effort, stays efficient the entire shift.

Other firsts in the Eimco 105 Tractor-Excavator include (1) independent track control so that one track can be run forward while the other turns reverse; (2) separate final drives for each track; (3) full track oscillation on the tractor when equipped with loading or excavating attachment: (4) elimination of master clutch and drag-track steering; (5) Unidrive transmission in which gearing always rotates in the same direction; (6) all alloy steel construction; (7) clutches that never need adjustment — and many other exclusive features.

See these completely new tractors as Bulldozers, Excavators or Loaders working near you. Write for complete information.

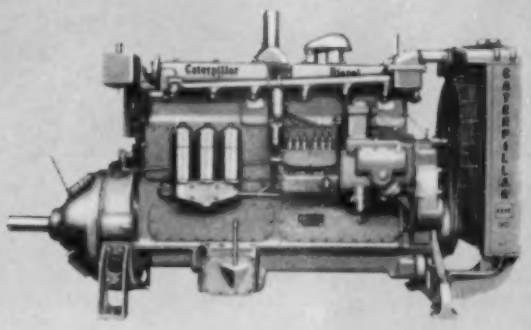
THE EIMCO CORPORATION

Salt Lake City, Utah—U.S.A. • Export Offices: Eimco Bldg., 52 South St., New York City

New York, N. Y. Chicago, Ill. San Francisco, Calif. El Paso, Tex. Birmingham, Ala. Duluth, Minn. Kellogg, Ida. Baltimore, Md. Pittsburgh, Pa. Seattle, Wash. Cleveland, Ohio Houston, Texas Vancouver, B. C. London, England Gateshead, England Paris, France Milan, Italy Johannesburg, South Africa

B-223

DEPENDABLE CATERPILLAR POWER HELPS CHANGE NIAGARA'S COURSE



Caterpillar-powered equipment is helping slow Niagara's famous Bridal Veil Falls to a temporary trickle. This CAT*-powered Koehring crane is swinging two men with sandbags to build a diversion dam in the Niagara River. Walter S. Johnson Building Co., Inc., of Niagara Falls, N. Y., is building a total of three dams. The objective is to direct the river flow away from two islands, which are badly water-eroded, so that overhanging precipices can be cut away.

"We've been in business 33 years," says Jack B. Johnson, vice president, "and when we discovered Cat quality, we stayed Caterpillar owners. They're dependable, durable machines." The Johnson company is 100% Caterpillar equipped. They have a D315 in another Koehring plus four Caterpillar track-type Tractors, in addition to the D13000 in this rig.

The D13000's reputation as a tough, long-wearing engine is now being carried on by its new modern version, the D342, which develops even more horsepower from the same size engine. The D342 is only one of the new models in the Caterpillar line of modern Diesel Engines, now available with maximum output capacities up to 650 HP.

All these new power plants share the advantages of Caterpillar's sturdy four-cycle construction. There's no need to clean air boxes or cylinder ports, or to tinker with fuel injection adjustments. These dependable yellow engines have such long-life features as "Hi-Electro" hardened crankshafts, special aluminum alloy bearings, and highly effective oil, air and fuel filters.

Your Caterpillar Dealer will tell you about the Caterpillar Engine that can do most work at lowest cost for longest time on *your* job. See him when it's time to repower—and specify Caterpillar power when you order new excavating equipment from a leading manufacturer.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

MODERN HEAVY-DUTY POWER